THE

AMERICAN GAS-LIGHT JOURNAL

THE OFFICIAL GAZETTE OF

LIGHT, HEAT, WATER-SUPPLY, AND SEWERAGE.

Iron Buildings, Nos. 254 & 256 Canal Street, East, near Broadway, New York.

VOL. II.—No. 31. NEW-YORK, MONDAY, APRIL 1, 1861. $3 PER ANNUM.

CORNELIUS & BAKER,
MANUFACTURERS OF
Lamps, Chandeliers, Gas-Fixtures, &c.,
MANUFACTORIES,
821 Cherry-St., and Fifth-St. and Columbia Avenue.
STORE, 710 CHESTNUT STREET,
PHILADELPHIA.

MITCHELL, VANCE & CO.,
MANUFACTURERS OF
CHANDELIERS,
AND EVERY DESCRIPTION OF GAS-FIXTURES.
WAREHOUSE, No. 620 BROADWAY,
MANUFACTORY, 335, 337, 339, 343 WEST 24th ST.,
NEW YORK.

GAS-FIXTURES,
BALL, BLACK & CO.,
565 & 567 Broadway,
CORNER OF PRINCE-STREET, NEW-YORK.
In addition to their large stock of
RICH GOODS,
Offer for sale a large assortment of
CHANDELIERS & GAS-FIXTURES
Of every description, and of the newest styles,
Both
FOREIGN AND DOMESTIC
Manufacture.

FELLOWS, HOFFMAN & Co.,
(LATE STARR, FELLOWS & CO.,)
MANUFACTURERS OF
GAS-FIXTURES AND CHANDELIERS,
Solar, Camphene & Fluid Lamps, Girandoles, Hall-Lanterns, &c.
No. 74 Beekman street, NEW YORK.
MANUFACTORY, 71, 73, 75, 77, 79, 81, 83 Boerum street,
And 88, 90, 92, 94, 96, 98 and 100 Johnston-st., BROOKLYN, N. Y.

E. V. HAUGHWOUT & CO.,
488, 490, & 492 BROADWAY,
Cor. of Broome-St., New York,
Gas-Fitters & Contractors for the Erection of Gas-Works.
Messrs. E. V. HAUGHWOUT & Co. have on hand a most extensive assortment of the newest and most desirable styles of
CHANDELIERS, BRACKETS, LAMP-POSTS, AND GAS FIXTURES OF EVERY DESCRIPTION,
to which they would respectfully call the attention of the public.
☞ Gas-fitting done in the most workmanlike manner, and on reasonable terms.

C. A. VAN KIRK & CO.,
MANUFACTURERS OF
GAS-FIXTURES AND CHANDELIERS,
Ambrose's Patent Coal-Oil Burners, to be used without Chimnies.
Patent Paragon Coal-Oil Burners, Patent Improved Excelsior Coal-Oil Burners, Hand Lamps, Columns, &c.
Manufactory at Frankford, Philadelphia.
SALES-ROOM, 630 CHESTNUT STREET.
☞ Every Article warranted equal in design and workmanship to any manufactured in the country.

M. L. CURTIS,
141 ELM STREET, NEW YORK CITY.
MANUFACTURER OF
GAS-FIXTURES.
Gas-Fitting in all its Branches.
OLD CHANDELIERS, &c., RE-FINISHED IN GILT, OR BRONZED
OR MADE TO APPEAR EQUAL TO NEW.

ANALYTICAL CHEMISTS.

CELTON BUCK, Analytical and Consulting Chemist, 254 Canal-st., New-York. Analyses of Ores, Minerals, Soils, Guanos, Coals, &c., and Tests of Commercial Articles, carefully and promptly made. Consultations may be had, and opinions given on Chemical questions. Samples for analysis from a distance, may be sent by mail or express, directed to the Laboratory as above.

LABORATORY OF CHEMISTRY, —Consultations on Chemistry applied to arts and manufactures, agriculture, metallurgy, analysis of ores, mineral waters, soils, &c. Advices on chemical fabrications. Address, Professor H. DUSSAUCE, Chemist, (from the Conservatoire Imperial of Arts and Manufactures, Paris) New Lebanon, N. Y.

ANALYTICAL & Manufacturing Chemistry.—Gesner's Chemical and Engineering Rooms. 24 William-street, New York. Rooms No. 28 and 29. Analysis made of all mineral and commercial articles. Coal oils tested, coal oil works erected, and contracts made. The best processes for purifying and deodorizing; coal and petroleum oils furnished, with skilful workmen and superintendents. Mines surveyed and coals tested. The Kerosene patents, from which the coal oil business in the United States originated, were granted to Dr. Gesner, Chemist and Geologist.

CLAY RETORTS.

NEW YORK FIRE-BRICK Manufactory. (Branch Works at Kreischerville, Staten Island.)
B. KREISCHER & CO., office 56 Goerck street, corner Delancy street, New York.
GAS-HOUSE TILES and FIRE BRICK of all shape and sizes. FIRE MORTAR, CLAY, and SAND articles of every description made to order at the shortest notice. B. KREISCHER, M. MAURER, A. WEBER.

KENNEDY'S Method of Securing Iron Mouth Pieces to Clay Retorts.—The Retort is made in the usual form, but without any bolt-holes through the flange. An iron collar in two pieces, is placed around the Retort behind the flange, and bolted to the mouth-piece outside of the flange instead of through it.
For Engravings, see AMERICAN GAS-LIGHT JOURNAL for June, 1860, page 345. Address the Patentee, JOHN P. KENNEDY, Trenton, N. J.

PATENT AGENTS.

TO INVENTORS.—Patent Agency of the AMERICAN GAS-LIGHT JOURNAL.—The Proprietor of the AMERICAN GAS-LIGHT JOURNAL, is happy to announce that a

PATENT DEPARTMENT

Is now connected with these ROOMS, under the charge of

MR. F. C TREADWELL, JR.,

Well known as one of the most prompt, reliable and able Patent Agents and Experts in the United States.

Patents taken out in this Country, and in GREAT BRITAIN, FRANCE, BELGIUM, and All other Countries where Patent Laws are in force.

Re-Issues, Rejected Applications, Interference Cases, attended to with the utmost personal care, and with Mr. TREADWELL'S long experience, the interests of Patentees will be unusually secure.

Inventors are cordially invited to visit the ROOMS of the AMERICAN GAS-LIGHT JOURNAL, Iron Buildings, Nos. 254 and 256 Canal street, East, near Broadway, New York

THE NEW PATENT LAW.

GREAT ADVANTAGES TO FOREIGNERS.

The New Patent Law approved March 4, 1861, now in force establishes the following scale of fees:

On filing each caveat	$10	or £ 2
On filing each application for a patent, except for a design	15 "	3
On issuing each original patent	20 "	4
On appeal to Commissioner of Patents.	20 "	4
On application for reissue	30 "	6
On application for extention of patent.	50 "	10
On granting the extension	50 "	10
On filing declaimer	10 "	2
On filing application for design 3½ years	10 "	2
On filing application for design, 7 years.	15 "	3
On filing application for design, 14 years	30 "	6

The above scale of fees applies to foreigners as well as citizens, excepting the residents of such countries as discriminate adversely to citizens of the United States.

Thus English, French, Austrian, Russian, Belgian, Spanish and all other foreigners except Canadians, stand upon the same footing (except in cases of designs,) as our own citizens.

The term for which patents are granted now is SEVENTEEN YEARS, instead of fourteen as heretofore.

Address, F. C. TREADWELL, JR.
Patent Agent and Expert,
Rooms of the AMERICAN GAS-LIGHT JOURNAL,
No. 256 Canal Street New York.

GAS-FIXTURES.

TIFFANY & COMPANY, Jewelers and Importers of elegant artistic PARIS GAS CHANDELIERS, BRACKETS, PENDANTS, &c., in BRONZE and GILT.
No. 550 BROADWAY, NEW YORK.

PHILADELPHIA GAS FIXTURE Works.—Warner, Miskey & Merrill, Manufacturers, Store, No. 718 Chestnut street, Philadelphia. Warner, Peck & Co., No. 376 Broadway, New York, would respectfully inform the public that they continue to Manufacture all kinds of Gas FIXTURES, Lamps, Girandoles, Bronzes, &c., and that their large and varied stock comprises the simplest as well as the most elaborate patterns, designed by their French artists. They also continue to keep at their store, 376 Broadway, a large and full assortment of all their manufactured Goods. Dealers and others are invited to call and examine.

GAS FIXTURES TO BE SOLD at Wholesale Prices.—In consequence of alterations in his store, the Subscriber is obliged to dispose of his entire stock of Gas Fixtures. Those wishing to purchase at very low prices will do well to call. Gas Fixtures removed. Gas fitting executed in all its branches.
J. H. VAN REED,
219 Bleecker-st., N. Y.

Gas Fixtures and Fittings. RINGUET-LEPRINCE & L. MARCOTTE, Warehouse, 347 Fourth street.—Manufactory, 55 West Sixteenth street, New York.
RINGUET-LEPRINCE, 3 Rue de la Paix, Paris.
Painting, Paneling, Cabinet Work, Looking Glass Plates, Mirror Frames, Silk, Worsted and Woolen Materials, Aubusson and Moquette Carpets, Gas Fixtures, Bronzes &c.

GEORGE H. KITCHEN & CO., Manufacturers of Fixtures for Gas Light purposes, Wood's Building, No. 561 Broadway, New York. Office of the Inspector of Gas Meters for the State of New York.

HARPER & O'CONNELL, Manufacturers of Gas Shades and Globes of every description. FRENCH CRIMPED GAS SHADES AND SMOKE BELLS Nos. 63 and 65 Elizabeth street, corner Hester, New York.

GAS-HOLDERS.

GASOMETERS, RETORT-HOUSE ROOFS, WATER-TANKS,
PURIFYING-BOXES, COAL CARS, COKE BARROWS,
AND ALL KINDS OF
WROUGHT-IRON WORK FOR GAS AND WATER WORKS.
Manufactured by GEORGE W. KRAFT, Chestnut street wharf, West Philadelphia, Pa.

GEORGE STACEY, Cincinnati, O., Manufacturer of single and Telescopic Gasholders, Wrought-Iron Bridges, Girders, Joists and Stairways, Coke and Coal Wagons, Rakes, Screens, and other Gas-works tools, Slide and Cup Valves, Bolts, Nuts, Chisels, Ladles and other tools, Wrought-iron roofs, for Slate and Corrugated Iron, Gas Purifiers, Washers, Centre Seal Valves and other Gas apparatus, Boiler-plate Retort Lids. Refer to—
Cincinnati Gas-Light & Coke Co.
Nashville Gas-Light Co.
Springfield Gas-Light Co.
Columbus Gas-Light Co.
Cleveland Gas-Light Co.
Covington and Newport Gas Light Co.
Memphis Gas-Light Co.
Indianapolis Gas-Light and Coke Co.
James H Caldwell, Esq., New Orleans.
John Jeffrey, Esq., Cincinnati.

POOLE & HUNT, Baltimore, Md., are prepared to execute orders for
GAS-HOLDERS,
IRON-ROOF FRAMING,
And all other Descriptions of
Iron Work for Gas-Works, Water-Pipes and Heavy Castings and Machinery Generally.

GAS-HOLDER FOR SALE.—25 feet diameter, 14 feet high, capacity about 6,800 feet. Has been in use but a short time. Good as new. Cast iron guide frame, balances weights and chains complete. Will be sold for $500, (which is less than half its cost) if applied for immediately. Address
M., Box 406 Post Office,
Philadelphia, Pa.

COAL-OIL & CANDLES.

CANDLES FROM COAL.—Manufactured by the New York Paraffine Candle Co. Under Meucci's Patent. The above Company having recently made great improvement in their mode of manufacture, now offer to the public a Candle superior to any other in the market. They give a softer and more brilliant light and burn 6 hours to the pound longer than the best wax and sperm, and considering the strength of the light, are the most economical Candles in use.

CAUTION.

As unscrupulous persons are already offering imitations of these Candles, purchasers should bear in mind, that every box sold by this Company is stamped with the annexed trade mark, to counterfeit which is felony.

For sale by all first-class grocers, and to the trade by WM. E. RIDER,
General Agent of the Company,
16 Beekman Street, New York.

STANDARD Photometric Candles.—Owing to a number of Applications made to me for information concerning the supply of the "Standard Sperm Candles," used in Photometrics, I have obtained a supply, from which I can furnish those who require them with full directions for use. T. W. PARMELE,
No. 4 Irving Place, New York.

TO CANDLE AND SOAP Makers.—Processes with drawings to manufacture every kind of candles and soaps by different processes: Candles by distillation, saponification, French candles, common candles, hard and soft soaps, palm soaps; processes to bleach palm oil and make candles out of it; purification of tallow; essays on greases and soaps. Address, Professor H. DUSSAUCE, Chemist, New Lebanon, N. Y.

J. L. McREA, Dealer in Coal Oils and Lamps, Binnacle and Signal Light Oils, 139 Water street, New York.

Rosin Oil and Rosin.—For sale of our own manufacture a superior article of ROSIN OIL, for Gas purposes. Also Refined Oil. For shipment in secure iron-bound barrels, or by any single barrel.

Address MARYLAND GAS COMPANY, No. 6 Bank of Baltimore Building, Baltimore, Md.

P. S. This Company is also prepared to construct their superior Patented GAS WORKS of any capacity, from that required for a private dwelling, hotel, church, college or factory, to such as will supply cities and towns, complete in all their parts for the manufacture of GAS, from either Rosin Oil, Coal, or Rosin.

THE LUTHER ATWOOD OIL CO.—Manufacturers of Superior Illuminating, Machinery and Binacle Oils. Office, No. 34 Burling Slip, New York.

EMPIRE CITY CAMPHENE Works.—Aaron Secley, Manufacturer and Distiller of camphene, alcohol, burning fluid, coal-oil, and dealer in naval stores, of every description. 32 and 34 Burling Slip, New York.

H. RYDER & CO., New Bedford, Mass.—Purchasers and Manufacturers of Semi-Crude Paraffine. Ryder's patent Paraffine Candles, manufactured and for sale.

NEW-BEDFORD OIL CO.—Office foot of South-st., New-Bedford. manufacture coal-oil for illuminating and lubricating purposes, of the best quality.
ABRAHAM H. HOWLAND.
Our Coal Oil will burn in all Kerosene Lamps.

LUBRICATING COAL OIL. Crude Oil, and Paraffine.—Calvin Dickey, Manufacturer of Lubricating Coal Oil, free from odor and chemicals, and warranted to be as good for cotton and woolen machinery as lard oil. This oil is now also used by several rail roads in it, pure state. Samples sent to responsible parties Also 32° crude oil, which will yield 75 per cent. of burning oil; and slack pressed Paraffine of superior quality. CALVIN DICKEY,
Newark, Ohio.

OLEOMETERS.

OLEOMETER, OR HYDROMETER. For Kerosene, Coal Oils, Petroleum and other Distilled Oils. Scale by Dr. Gesner. Manufactured and sold by
G. TAGLIABUE,
298 Pearl-st., New York.

PORTABLE GAS-WORKS.

THE AUBIN GAS-WORKS CO., No. 44 State street, Albany, N. Y., will refer parties wanting GAS-WORKS FOR VILLAGES to seventeen of their Village Works now in operation in the United States and the Canadas in *every one of which the profits of the company are ten per cent. and upwards, and yet good gas is furnished.* Agents wanted to extend the sale of the AUBIN PORTABLE GAS STOVE for dwellings, factories, &c., which will make 1000 feet of gas in five hours, and with greater simplicity, safety and economy, than any other known apparatus.

BUTLER'S PATENT PORTABLE ROSIN GAS-WORKS,
FOR
DWELLINGS, CHURCHES, COUNTRY VILLAGES
AS WELL AS FOR CONSUMERS IN LARGE CITIES.
JOHN BUTLER,
No. 112 Fulton-st and 15 Henry-st.,
Brooklyn, N. Y.

FOR LIGHTING RAILROAD CARS AND STEAMBOATS WITH GAS.
The whole process of Filling the Gas-Holders of a Railway Train, requires but Three Minutes.
APPLY TO THE
NEW YORK CAR & STEAMBOAT GAS CO.,
No. 117 Fulton st., N. Y.

C. R. WOODWORTH, Manufacturer of PORTABLE GAS-WORKS,
74 WALL STREET, New York City.

PORTABLE GAS WORKS.—S. T. McDOUGALL'S PATENT Portable Gas Works, for making Gas from Rosin, Rosin Oil, Coal Oil, Naptha, Grease, etc. These Works combine the latest improvements in gas making, and are guaranteed to be superior to any in market. They are made of all sizes, suitable for either country or city use. No county house is complete without its Gas Works. Gas Stoves of every description on hand and made to order. For sale by S. T. McDougall, 170 Center Street, New York.
Agents wanted in other cities to sell rights or machines.

GAS FOR THE COUNTRY.—C. WOOSTER, Manufacturer of Improved Portable Gas-Machines, for Villages, Public Institutions, Churches, Hotels, Railroad Depots, Factories, Mills, Machine-Shops, Plantation Dwellings, &c. Office, 256 Canal street, near Broadway.

This Machine has been in successful operation for years, in many of the best residences and factories in the country, and for simplicity of construction, ease of management and economy of light produced, possess advantages over all other machines for the purpose now in use. It is adapted to the making of Gas from Crude Rosin or Rosin-Oil, producing a Gas of twice the illuminating power of Coal-Gas, at about one half the price usually charged for that gas.

Every Machine is sold under a strict guarantee to operate according to representation, and no payment required until the fact is demonstrated by actual use.

For further particulars, and descriptive pamphlet containing references to numerous parties now using the apparatus, address
C. WOOSTER,
No. 256 Canal-st., near Broadway, N. Y.
For Engravings, see AMERICAN GAS-LIGHT JOURNAL, for June, 1860, page 245.
☞ Responsible Agents wanted, with whom liberal arrangements will be made.

APPLETON'S IMPROVED GAS- Works, for Factories, Hotels, Dwellings, and Towns. The most simple and economical works in use, furnishing a superior light to coal gas at a cost of one half a cent per burner per hour. It does not injure trees, or plate, and is not affected by cold. For Circular and Terms apply to APPLETON & GRAHAM,
56 Washington street, Boston.
For Engravings, see AMERICAN GAS-LIGHT JOURNAL for April, 1860, page 213.

ROSIN GAS-WORKS, for Factories, Hotels, and Public Buildings. These works may be seen in operation at the Berkshire Woolen Mills, Great Barrington, Mass.; Manchester Mills, Manchester, Ct.; A. A. Van Alen & Co's. Factories, Stuyvesant Falls, N.Y., and many other places JAMES O. MORSE & CO.,
76 John-st., New York.

MARSH'S PATENT ROSIN or Sun-Light Gas-Works, for Private Dwellings, Hotels, Factories, Railway stations, Sugar-Houses, Towns, &c. By the peculiar construction of the Retorts, the largest amount of decomposing surface is obtained in the smallest space. 2d. Gas is manufactured from crude rosin, without the least deposit of carbonaceous matter in the retorts or pipes: thus enabling them to be operated continuously, generating rapidly the best and cheapest illuminating gas obtained from this material. ALFRED MARSH & CO.,
241 Broadway, New York.

GASOMETER RIVETS.

PHILLIPS & ALLEN, Pennsylvania avenue, above 22d street, Philadelphia.—GASOMETER RIVETS of all kinds.

CROTON WATER ARREARS.

CITY OF NEW YORK, Department of Finance, Bureau of Arrears, Feb. 21, 1861.—Redemption of Lands and Tenements Sold for TAXES and Regular Rents of Croton Water.—Public notice is hereby given to the owners, mortgagees and lessees and persons otherwise interested in the lands and tenements sold in the year 1859 for the taxes of the years 1852, 1853 and 1854, and the regular rents of the years 1852 and 1853, that a detailed statement of such lands and tenements as have not been redeemed from the said sale is published in the *Evening Post*, a daily newspaper, printed and published in the City of New York. Such statement describes the lands and tenements sold and not redeemed, the amount and the term of years for which they were respectively sold, when the time for the redemption thereof will expire, &c., &c.
JOSEPH C. PINCKNEY, Clerk of Arrears.

IRON RETORTS.

CELLULAR GAS-RETORTS. C. M. CRESSON'S CELLULAR GAS Retorts, Patented October 3d, 1854. Adapted to the manufacture of GAS from Rosin, Coal, Wood, &c., and now in use at the Philadelphia Gas Works. Patent Rights for sale. For information apply to HENRY S. HAGERT, Attorney for Patentee, S. E. cor. of Walnut and Sixth streets, Philadelphia, Pa.

FOR SYMMES' PATENT RE- torts, Mouthpieces, &c. address—
ELLIMAN BROTHERS, 217 Pearl-st., New York.
MORRIS, TASKER & CO, Philadelphia.
Or H. K. SYMMES, Newton, Mass.
See Engravings in AMERICAN GAS-LIGHT JOURNAL for July 1, 1860, page 280.

MISCELLANEOUS.

MESSRS. J. WRIGHT & CO., CONSULTING ENGINEERS and SOLICITORS of PATENTS, No. 42 Bridge street, Blackfriars, London, E. C. Patents for inventions obtained in all countries where Patent Laws are in force.

PHOTOMETER APPARATUS and Room for Sale.—The Room is about 6 feet wide by 12 feet long, painted black inside and screwed together. It can be taken down and boxed for transportation. All the pipes and fittings are complete for immediate use. Address PHOTOMETER, care of the AMERICAN GAS-LIGHT JOURNAL, 254 Canal Street, New York.

GAS & WATER-PIPE.

W. & J. GRIFFITHS & CO.—City Tube Works, Malleable Iron, and Brass Foundry, No. 27 North Seventh Street, Philadelphia. Manufacturers of Wrought Iron Pipe, Lap Welded Flues and Fittings: also, Brass Work of all descriptions, for gas, steam and water, Particular attention given to heating buildings, &c.

PARIS'S PATENT
GLASS-ENAMELLED WROUGHT IRON TUBES.
PROSSER'S PATENT
LAP-WELDED IRON BOILER TUBES.
TUBES FOR ARTESIAN WELLS, CONVEYING STEAM OR WATER, SHAFTING, &C., SCREWED OR COUPLED TOGETHER, IN VARIOUS WAYS.
THOS. PROSSER & SON, 28 Platt-st. N. Y

CAST AND WROUGHT IRON Pipe, Branches, Elbows, Sleeves, &c. Lamp-posts, Wrought iron Lanterns for Lamp-posts, Gas Retorts (clay or iron), Street Mains in 9 or 12 feet lengths. Sheet iron cut to pattern for Gas-holders. For sale by the manufacturers' Agent,
HENRY G. NICHOLS, 24 Pine-st N. Y.

HUNTER, KELLER & CO., Manufacturers of
WROUGHT-IRON PIPES, AND FIXTURES
of all descriptions, for
STEAM, WATER AND GAS,
144 Centre street, New York.

GIRARD TUBE WORKS. MURPHY & ALLISON, Proprietors. Wrought Iron Coke-Welded Tubes, for Gas, Water, Steam, &c. Wrought, Cast and Malleable Iron Fittings, Steam and Gas Cocks, Valves. Also, Galvanized Tubes and Fittings.
Office 1908 Market street, Philadelphia.

AMERICAN TUBE WORKS.—W. G. Smith & Co., Forty-sixth street, east of 10th Avenue, New York City. Manufacturers of WELDED IRON PIPE, for Steam or Gas, of all sizes, from 1-8th to 3 inches.

JOSEPH NASON & CO., 61 BEEK- MAN STREET, corner of Gold street, New York, Manufacturers of Wrought and Cast Iron Pipes, and every description of Steam and Gas Fittings, used by Engineers, Manufacturers, and Gas Fitters.

Boiler Flues,	Back Pressure Valves,
Steam Boilers,	Steam Traps,
Boiler Pumps,	Steam Whistles,
Steam Pumps,	Guage Cocks,
Steam Gauges,	Gas Cocks,
Safety Valves,	Gas Meters,
Stop Valves,	Fitters' Tools,
Check Valves,	Proving Pumps,
Governor Valves,	Screwing Machines.

JOSEPH NASON,
HENRY R. WORTHINGTON.

PLUMBERS & GAS-FITTERS.

LOCKE & CRAIGIE, Plumbers and Gas-Fitters, No. 12 East 20th street, New York.

LOCKE, CRAIGIE & CO., Gas-Fittings, Chandeliers, Brackets, Globes, &c., No. 927 Broadway, New York.
☞ Particular attention paid to country work.

JAMES HELME, Chandelier and Gas-Fitting Establishment, No. 58, East Thirteenth street, between Broadway and University Place, New York.

JOHN W. FARMER,
PLUMBER AND GAS-FITTER,
No. 248 BROOME STREET,
NEW-YORK.

BRADBURY M. JOHNSON, GAS-Fitter and Plumber, No. 111 East Eighteenth street, New York:
A large and elegant assortment of CHANDELIERS, BRACKETS, &c. Gas-Pipe and Posts made for Gas Companies on favorable terms.

M'KENZIE & O'HARA, Plumbers and Gas-Fitters, No. 326 FOURTH STREET, CORNER OF MERCER ST., NEW YORK.
Water Closet Pans, Wine Basins, Wash Basins, Sinks, Fountains, Jets for public and private purposes, Stop-cocks, Filters, and all other Water apparatus.
ALSO, a complete assortment of Gas-fixtures Pendants, Chandeliers, Brackets, &c &c.

HEATING APPARATUS.

JOSEPH NASON & CO., Constructors of apparatus for warming Public and Private Buildings by Steam and Hot Water.
Improved Fans for ventilating Hospitals and other public buildings.
JOSEPH NASON.
HENRY R. WORTHINGTON.
No. 61 Beekman street, corner of Gold street, New York.

STEAM DOMESTICATED.—Low Pressure Steam for Domestic Warming, an Apparatus which is simple, durable, economical, and perfectly safe. Estimates given and work done in any part of the country.
Descriptive pamphlets furnished on application to BAKER, SMITH & CO.,
Sole manufacturers, Nos. 180 and 182
Centre street, N. Y.

GEORGE L. CANNON, Successor to the Rippowam Co., 54 East 13th street, between Broadway and University Place manufacturer and dealer in Air, Water, and Steam Warming and Ventilating Apparatus, Cooking Ranges, Range Furniture, Registers, Ventilators, &c.
Particular attention given to Heating Churches, School Houses, Public Buildings &c.

HOT WATER GAS-STOVES, Manufactured by HUNTER, KELLER & Co., 144 Centre-st., New York.
See Engravings on page 163, Vol. II., of this JOURNAL.

GAS-BURNERS.

T. G. ARNOLD, Manufacturer of Gas Burners, Mercury Cups, Portable Sockets, Burner Pillars, &c., No. 447 Broome street (second door west of Broadway), New York. Imported Scotch Tips and Burner Plyers always on hand

ORNE'S PATENT FILTER-REG- ULATING GAS BURNER, admitted by all practical and scientific men, who have examined its movements, to be
THE BEST GAS BURNER YET INVENTED.
They are self-regulating, gas-purifying indestructible, and most economical.
For sale by S. A. STETSON & CO.,
350 Washington-st., Boston.

PERFECTION.—This recent Improvement in Gas-Burners, embraces the great economy of the Hicks Patent Burner, a gain of over 75 per cent. in light. This Burner is now offered to the Trade and all consumers of gas, at the price of the common burner. It is anti-corrosive, gives a uniform and beautifully-shaped blaze, under any pressure, and will not get out of order.
It has been adopted by the Manhattan and Brooklyn, N. Y., Gas-Light Cos., for street lamps.
Samples will be sent to each Gas Co., in the United States, if requested.
Address L. E. HICKS,
335 Broadway, New York.

ROOFING.

PATENT ASPHALTE ROOFING and SHIP SHEATHING FELTS, the cheapest, best, and most durable ever offered to the public. Circulars, samples, &c., will be forwarded free. Agents wanted for city and towns. None genuine unless purchased of AARON A. DEGRAUW, 242 South street, our sole agent for the United States. CROGGON & CO., London

WHERE GAS-WORKS AND WATER-WORKS ARE WANTED.

We are now publishing regularly the names of the thirty thousand post-towns in the United States, so that builders of gas-works and water-works, and the various manufacturers may see where are new openings for business. And as each post master will receive several copies of the AMERICAN GAS-LIGHT JOURNAL, for distribution, the number thus circulated will probably exceed *Three Million Copies. What a chance for advertisers!*

POST-OFFICE TOWNS IN THE UNITED STATES.

ARRANGED BY STATES AND COUNTIES,

Shewing where Gas-Works and Water-Works are Wanted

INDIANA.

91 Counties, 1,161 Towns, 7 Gas-Works, 2 Water-Works.

(*Concluded from page* 279.)

Marion County.

Acton, Adair, Augusta Station, Bridgeport, Broad Ripple, Castleton, Clermont, Cumberland, Pall Creek, Gallaudet, Germantown, Glen's Valley, *Indianapolis*, (c. h.,) Lawrence, Millersville, Southport, West Newton.

Marshall County.

Alden, Argos, Bourbon, Bremen, Fairmount, Lycurgus, Maxinouckee, *Plymouth*, (c. h.,) Sidney, Sligo, Tippecanoetown, Tyner City, Wolf Creek, Yellow River.

Martin County.

Dover Hill, Dye, Halbert's Bluff, Keck's Church, Loogootee, McCameron, McCormickstown, Mountain Springs, Mount Pleasant, Natchez, Trinity Springs, Willow Valley.

Miami County.

Cary, Chili, Five Corners, Gilead, Leonda, Mexico, Miami, Niconza, Palos, Paw Paw, Perrysburgh, *Peru*, (c. h.,) Reserve, Santa Fe, Stockdale, Wawpecong, Wheatville, Xenia.

Monroe County.

Bloomington, (c. h.,) Bryant's Creek, Elliottsville, Harrodsburgh, Mount Tabor, Smithville, Stanford, Unionville.

Montgomery County.

Alamo, Ashby's Mills, Beck's Corners, Brown's Valley, *Crawfordsville*, (c. h.,) Darlington, Ladoga, Linden, Mace, New Richmond, New Ross, Parkersburgh, Pleasant Hill, Prairie Edge, Shannondale, Sugar River, Waveland, Waynetown, Whitesville, Yountsville.

Morgan County.

Brooklyn, Centerton, Centre Valley, Eminence, Hall, Mahalaville, *Martinsville*, (c. h.) Monrovia, Mooresville, Morgantown, Mount Washington, Sheasville, Waverly, White River.

Noble County.

Albion, (c. h.,) Avilla, Bourie, Cold Springs, Cornwell, Hecla, Kendallsville, Ligonier, Lisbon, Merriam, Noble C. H., Northport, Simon's Corners, Springfield Mills, Swan, Wawaka, Wilmot, Wolf Lake,

Ohio County.

Aberdeen, Bear Branch, Hartford, Rising Sun.

Orange County.

Campbell, Chambersburgh, French Lick, Leipsic, McDonald's, Newton Stewart, Orangeville, Orleans, *Paoli*, (c. h.,) Stamper's Creek, Valeene.

Owen County.

Alligator, Arney, Atkinsonville, Cataract, Cuba, Deem, Freedom, Gosport, Hausertown, Jordon Village, Patricksburg, Quincy, *Spencer*, (c. h.,) Stockton, Vandalia, White Hall.

Parke County.

Annapolis, Armiesburgh, Banner Mills, Bellmore, Bethany, Bridgeton, Bruin's Cross Roads, Clinton Lock, Delta, Gallatin, Hollandsburgh, Howard, Ionia, Lick Branch, Lodiville, Mansfield, Medelline, Montezuma, Numa, Parkville, Pattsville, *Rockville*, (c. h.,) Roseville, Russell's Mills, Sylvania, Wright's Mills.

Perry County.

Cannelton, Derby, Don Juan, Foster's Ridge, Leopold, Lilly Dale, Lusher's, Rome, Rono, Tell City, *Troy*, (c. h.)

Pike County.

Delectable Hill, Hawthorn's Mills, High Banks, Kinderhook, Petersburgh, Union, White Oak Grove, Winslow.

Porter County.

Boone Grove, Coffee Creek, Hebron, Porter's Cross Roads, Tassinong Grove, Valparaiso, Wheeler.

Posey County.

Blairsville, Cynthiana, Farmersville, McFadden, *Mount Vernon*, (c. h.,) New Harmony, Parker's Settlement, Poseyville, Saint Wendels, Stewartsville, Wadesville, West Franklin.

Pulaski County.

Francesville, Medaryaville, Monterey, Mooresburg, Oak, Pulaski, Two Mile Prairie, *Winnamack*, (c. h.)

Putnam County.

Alma, Bainbridge, Brunerstown, Carpentersville, Cloverdale, *Greencastle*, (c. h.,) Groveland, Manhattan, Mount Meridian, New Maysville, Nicholsonville, Norton, Portland Mills, Putnamville, Reelsville, Russellville.

Randolph County.

Arba, Balaka, Bartonia, Bloomingsport, Cerro Gordo, Deerfield, Emmettsville, Fairview, Farmland, Harrisville, Jordan, Losantville, Lynn, Mar's Hill, Neff, New Pittsburgh, Parker, Ridgeville, Snow Hill, Spartanburg, Trenton, Union City, *Winchester*, (c. h.,) Windsor.

Ripley County.

Ballstown, Batesville, Cross Plains, Delaware, Elrod, Hart's Mill's, Hermann, Holton, Milan, Morris, Napoleon, New Marion, North Hogan, Olean, Osgood, Pierceville, Poston, Spade's Depot, Springtown, Sunman, *Versailles*, (c. h.,) Way.

Rush County.

Beech Grove, Bloom, Carthage, Groves, Hannegan, Homer, Manilla, Melrose, Milroy, Moscow, New Salem, Raleigh, Richland, *Rushville*, (c. h.,) Smelser's Mills, Star, Steele's, Swain's Mills.

St. Joseph County.

Cottage Hill, Lakeville, Mishawaka, New Carliale, North Liberty, Notre Dame, Oceola, Richardson, *South Bend*, (c. h.,) Sumption Prairie, Terre Coupee, West York, Woodland.

Scott County.

Afton, Alpha, Austin, *Lexington*, (c. h.,) Mayfield, New Frankfort, Pigeon Roost, Vienna.

Shelby County.

Blue Bell, Blue Ridge, Conn's Creek, Davisville, Fairland, Flat Rock, Freeport, London, Manwarings, Marietta, Martin's Corners, Moral, Morristown, Mount Auburn, Noah, Pleasant View, *Shelbyville*, (c. h.,) Smithland, Sulphur Hill, Winterrowd.

Spencer County.

Dale, Enterprise, French Island, Fulda, Gentryville, Grand View, Midway, New Boston, Oakland, *Rockport*, (c. h.,) Santa Claus.

Stark County.

Bogus Run, Clear Lake, Grover Town, Knox, Lake City, North Bend, San Piere, Toto.

Steuben County.

Alvarado, *Angola*, (c. h.,) Crooked Creek, Fish Creek, Flint, Fremont, Hamilton, Meta, North East, Orland, Pleasant Lake, Salem Centre, Sandy Ridge, Turkey Creek, York Centre.

Sullivan County.

Ascension, Bateham, Black Creek, Brick Mill, Carliale, Currysville, Graysville, Hymeres, Merom, New Lebanon, *Sullivan*, (c. h.,) Turman's Creek.

Switzerland County.

Allensville, Bennington, Craig, Florence, Grant's Creek, Jacksonville, Moorefield, Mount Sterling, Patriot, Pleasant, Quercus Grove, Rutherford, Sugar Branch, *Vevay*, (c. h.)

Tippecanoe County.

Americus, Baker's Corners, Battle ground, Buchanan, Clark's Hill, Concord, Dayton, *Lafayette*, (c. h.,) Petlit, Romney, Shawnee Mound, Sugar Grove, Transitville, West Point, Wyandotte.

Tipton County.

Curtisville, Nevada, New Lancaster, Normanda, Pine Creek, Prailie, Sharpsville, Tetersburg, Tipton C. H., West Kinderhook, Windfall.

Union County.

Beechy Mire, Billingsville, Brownsville, Clifton, Cottage Grove, Dunlapsville, *Liberty*, (c. h.)

Vanderburgh County.

Armstrong, *Evansville*, (c. h.,) McCutchonville, Nash Depot, Oakdam, Saundersville.

Vermillion County.

Clinton, (c. h.,) Eugene, Highland, Indiana Furnace, *Newport*, (c. h.,) Perrysville, Toronto.

Vigo County.

Cookerly, Fruit Hill, Lewis, Maurius, New Goshen, Pimento, Prairie Creek, Prairieton, Riley, Saint Marys, Sandford, *Terre Haute*, (c. h.)

Wabash County.

America, Belden, Dora, La Fontaine, La Gro, Laketon, Liberty Mills, Lodi, New Holland, North Manchester, Somerset, Urbana, Wabash.

Warren County.

Baltimore, Independence, Marshfield, Pine Village, Poolsville, Rainsville, State Line, West Lebanon, *Williamsport*, (c. h.)

Warrick County.

Boonville, (c. h.,) Canal, Crowville, Hartsboro, Lee, Lynnville, Newburgh, Polk Patch, Yankeetown.

Washington County.

Beck's Mills, Campbellsburg, Canton, Chesnut Hill, Claysville, Flower Gap, Forester's Station, Fredericksburgh, Hardinsburgh, Harristown, Hitchcock, Kossuth, Little York, Livonia, Martinsburgh, New Philadelphia, New Retreat, Organ Spring, Pekin, Prowsville, *Salem*, (c. h.,) Saltilloville, South Boston, Texas, Walnut Ridge.

Wayne County.

Abington, Bethel, Boston, Cambridge, *Centreville*, (c. h.,) Chester, Cox's Mills, Dalton, Dublin, East Germantown, Economy, Green's Fork, Hagerstown, Jacksonburgh, Milton, Neil's Station, New Garden, Olive Hill, Richmond, Webster, White Water, Williamsburgh,

Wells County.

Barber's Mills, *Bluffton*, (c. h.,) Fox, Lake Creek, Liberty Centre, Murray, Nottingham, Ossian, Reiffsburg, Vera Cruz, Zanesville.

White County.

Brookston, Buffalo, Burnett's Creek, Cathcart, Flowerville, Monon, *Monticello*, (c. h.,) Mudge Station, Reynolds,

Whitely County.

Churubusco, Coesse, Collamer, Columbia City, Fuller's Corners, Laud, Saturn, South Cleveland, South Whitley, Summit, Washington Centre.

A MAN'S BODY A LIVING STOVE.—The *Eclectic Review*, treating of the caloric or heat in a human body, compares our body to a "living stove—walking fire-places—furnaces in the flesh," if those terms can be applied to any apparatus for the express production of human caloric. After stating the fact of the latent heat of the human frame, the writer says: Suppose it to be the month of January, when winter is presumed to be reigning in full vigor, and every inanimate object appears to have been drained of its caloric; still the human structure will exhibit a surplus of sixty degrees above the freezing point. Why is this? How does it happen that while a bronze statue fluctuates in its temperature with every passing breeze, the living organism maintains its standard heat unimpaired, and preserves its tropical climate within, although the air should be full of frost and the ground enveloped in snow? It is manifest that we must have some power of "brewing" caloric for ourselves. Assuming that our bodies are veritable stoves, the reviewer proceeds to explain where we procure our fuel. Fortunately our coal and firewood, he adds, are stowed up in a very interesting form. They are laid before us in the shape of bread and butter, pudding and pies, rashers of bacon for the laborer, and haunches of venison or turtle soup for the epicure. Instead of being brought up in scuttles, they are presented in tureens, dishes or tumblers, or all of them in pleasing succession.

Speaking seriously, and looking at the question from a mere human point of view, could any project appear more hopeless than one for burning fuel in a soft, delicate fabric like the human body—a fabric composed, for the most part, of mere fluids—a fabric that might be easily scorched by excess of heat, or damaged by excess of cold? Does it not apppear like a touch of Quixotism in nature to design a stove with flesh for its walls, veins for its flues, skin for its covering? Yet here we have seen, is an apparatus which, as if by magic, produces a steady stream of heat—not trickling penuriously from the fountains, but flowing on day and night, winter and summer, without a moment's cessation, from January to December,

Carry this splendid machine to the coldest regions on the globe—set it up in a region where the frosts are so crushing that nature seems trampled dead—it still pours on its mysterious supplies with unabated profusion. It is an apparatus, too, which does its work unwatched and in a great measure unaided. The very fuel which is thrown into it in random heaps is internally sifted and sorted, so that the true combustible elements are conveyed to their place and applied to their duty with unerring precision. No hand is needed to trim its fires, to temper its glow, to remove its ashes. Smoke there is none, spark there is none, flame there is none. The pulmonary chimney is never clogged with human grime. All is so delicately managed that the fairest skin is neither shriveled nor blackened by the burnings within. Is this apparatus placed in circumstances which rob it too fast of its caloric? Then the appetite becomes clamorous for food, and in satisfying its demands the fleshy stove is silently replenished. Or, are we placed in peril from superabundant warmth? then the tiny flood-gates of perspiration are flung open, and the surface is laid under water until the fires within are reduced to their wonted level.

Assailed on the one hand by heat, the body resists the attempt, if resistance be possible, until the store of moisture is dissipated; assailed on the other by cold, it keeps the enemy at bay until the hoarded stock of fuel is expended. Thus protected, thus provisioned, let us ask whether these human hearths are not entitled to rank among the standing marvels of creation? for is it not startling to find that, let the climate be mild or rigorous, let the wind blow from the sultry desert or come loaded with polar sleet, let the fluctuations of temperature be as violent as they may without us, there shall be still a calm, unchanging, undying summer within us.

THE CHEMICAL HISTORY OF A CANDLE.

BY PROFESSOR FARADAY.

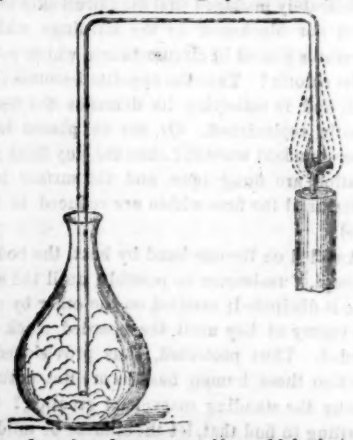
A course of six Lectures (adapted to a Juvenile audience) Delivered before the Royal Institution of Great Britain.

LECTURE II.

A CANDLE; BRIGHTNESS OF THE FLAME—AIR NECESSARY FOR COMBUSTION—PRODUCTION OF WATER.

We were occupied, the last time we met, in considering the general character and arrangement as regards the fluid portion of a candle, and the way in which that fluid got into the place of combustion. You see, when we have a candle fairly burning in a regular, steady atmosphere, it will have a shape something like the one shown in the diagram, and looking pretty uniform, although very curious in its character. And, now, I have to ask your attention to the means by which we are able to ascertain what happens in any particular part of the flame; why it happens; what it does in happening; and where, after all, the whole candle goes to; because, as you know very well, a candle being brought before us and burned, disappears, if properly burned, without the least trace of dirt in the candlestick—and this is a very curious circumstance. Now, in order to examine this candle carefully, I have arranged certain apparatus, the use of which you will see as I go on. Here is a candle; I am about to put the end of this glass tube into the middle of it—into that part which old Hooker has represented in the diagram as being rather dark, and which you can see at any time if you will look at a candle carefully, without blowing it about. We will examine this dark part first.

Now I take this bent glass tube, and introduce one end into that part of the flame, and you see at once that something is coming from the flame, out at the other end of the tube; and if I put a flask there, and leave it for a little while, you will gradually see that something from the middle part of the flame is drawn out and goes through the tube and into that flask, and there behaves very differently from what it does in the open air. It not only escapes from the end of the tube, but falls down to the bottom of the flask, like a heavy substance, as indeed it is. We find that this is the wax of the candle converted into a vaporous fluid—not a gas. You must learn the difference between a gas and a vapor; a gas remains permanent—a vapor is something that will condense. If you blow out a candle, you perceive a very nasty smell consequent on the condensation of this vapor. This is very different from what you have outside the flame; and in order to make it more clear to you, I am about to produce and set fire to a larger portion of this vapor—for what we have in a small way in a candle, to understand thoroughly, we must, as philos-



-ophers, prodnce in a larger way if needful, that we may examine the different parts. And, now, Mr. Anderson will give me a source of heat; and I am about to show you what that vapor is. Now, here is a glass flask, and I am going to make it hot, as the inside of the candle flame is hot, and the matter about the wick is hot. [The lecturer placed some pieces of wax in a glass flask and heated them over a lamp.] Now, I dare say, that is hot enough for me. You see that the wax I put in it has become fluid, and there is a little smoke coming from it. We shall very soon have the vapor rising up. I ill make it still hotter, and now we get more of it, so that I can actually pour the vapor out of the flask into that basin, and set it on fire there. This, then, is exactly the same kind of vapor as we have in the middle of the candle; and that you may see that that is the case, let us try whether we have not got here, in this flask, a real combustible vapor out of the middle of the candle—[taking the flask into which the tube from the candle proceeded, and introducing a lighted taper]. See how it burns. Now this is the very vapor from the middle of the candle, produced by its own heat; and that is one of the first things you have to consider with respect to the progress of the wax in the process of combustion, and as regards the changes it undergoes. I will arrange another tube carefully in the flame, and I should not wonder if we were able by a little care, to get that vapor to pass through the tube to the other extremity, where we will light it and obtain absolutely the flame of the candle at a place different from it. Now, look at that. Is not that a very pretty experiment? Talk about laying on gas—why, we can actually lay on a candle! And you see from this that there are clearly two different kinds of action—one the *production* of the vapor, and the other the *combustion* of it—both of which take place in particular parts of the candle.

I shall get no vapor from that part that is already burnt. If I raise the tube to the upper part of the flame, so soon as the vapor has been swept out, what comes away will be no longer combustible; it is already burned. How burned? Why burned thus: In the middle of the flame where the wick is, there is this combustible vapor; on the outside of the flame is the air which we shall find necessary for the burning of the candle; between the two, intense chemical action takes place whereby the air and fuel act upon each other, and at the very same time that we obtain light the vapor inside is destroyed. If you examine where the heat of a candle is, you will find it very curiously arranged. Suppose I take this candle and hold a piece of paper close upon the flame, where is the heat of that flame? Do you not see that it is not in the inside? It is in a ring, exactly in the place where I told you the chemical action was; and even in my irregular mode of making the experiment, if there is not too much disturbance, there will always be a ring. This is a good experiment for you to make at home. Take a strip of paper, have the air in the room quiet, and put the piece of paper right across the middle of the flame (I must not talk while I make the experiment), and you will find that it is burnt in two places, and that it is not burnt, or very little so, in the middle; and when you have tried the experiment once or twice, so as to make it nicely, you will be very interested to see where the heat is, and to find that it is where the air and fuel come together.

This is most important for us as we proceed with our subject. Air is absolutely necessary for combustion; and what is more, I must have you to understand that *fresh* air is necessary, or else we should be imperfect in our reasoning and our experiments. Here is a jar of air, I place it over a candle, and it burns very nicely in it at first, showing that what I have said about it is true; but there will soon be a change. See how the flame is drawing upward, presently fading, and last going out. And going out, why? Not because it wants air merely, for the jar is as full now as it was before; but it wants pure air, fresh air. The jar is full of air partly changed, partly not changed; but it does not contain sufficient of the fresh air which is necessary for the combustion of a candle. These are all the points which we, as young chemists, have to gather up; and if we look a little more closely into this kind of action, we shall find certain steps of reasoning extremely interesting. For instance, here is the oil lamp I showed you—an excellent lamp for our experiments—the old Argand lamp. I now make it like a candle [obstructing the passage of air into the centre of the flame]; there is the cotton; there is the oil rising up it; and there is the conical flame; it burns poorly because there is a partial restraint of air. I have allowed no air to get to it, save round the outside of the flame, and it does not burn well. I cannot admit more air from the outside, because the wick is large; but if, as Argand did so cleverly, I open a passage to the middle of the flame, and so let air come in there, you will see how much more beautifully it burns. If I shut the air off, look how it smokes; and why? We have now some interesting points to study: we have the case of the combustion of a candle; we have the case of a candle being put out by the want of air; and we have now the case of imperfect combustion, and this is to us so interesting, that I want you to understand it as thoroughly as you do the case of a candle burning in the best possible state. I will now make a great flame, because we need the largest possible illustrations. Here is a larger wick [burning turpentine on a ball of cotton]. All these things are the same as candles, after all. If we have larger wicks we must have a larger supply of air, or we shall have less perfect combustion. Look now at this black substance going up into the atmosphere; there is a regular stream of it. I have provided means to carry off the imperfectly-burnt part, lest it should annoy you. Look at the soots that fly off from the flame; see what an imperfect combustion it is, because it cannot get enough air. What, then, is happening? Why, certain things which are necessary to the combustion of a candle are absent, and very bad results are accordingly produced; but we see what happens to a candle when it is burnt in a pure and proper state of air. At the time when I showed you this charring by the ring of flame on the one side of the paper, I might also have shown you, by turning to the other side, that the burning of a candle produces the same kind of soot—charcoal or carbon.

But, before I show that, let me explain to you, as it is quite necessary for our purpose, that, though I take a candle and give you, as the general result, its combustion in the form of a flame, we must see whether combustion is always in this shape—when I say "shape" I mean condition—or whether there are other conditions of flame; and there are, and they are most important to us. I think perhaps the best illustration of such a point as that, being young ones, is to give you the result of strong contrast. Here is a little gunpowder. You know that gunpowder burns with flame; we may fairly call it flame. It contains carbon and other materials, which altogether cause it to burn with a flame. And here is some pulverized iron, or iron filings. Now, I purpose burning these two things together. I have a little mortar in which I will mix them. (Before I go into these experiments, let me hope that none of you, by trying to repeat them for fun's sake, will do any harm. These things may all be very properly used if we take care, but, without that, much mischief will be done.) Well, then, here is a little gunpowder, which I put at the bottom of that little wooden vessel, and mix the iron filings up with it, my object being to make the gunpowder set fire to the filings and burn them in the air, and thereby show the difference between substances burning with flame and not with flame. Here is the mixture, and when I set fire to it you must watch the combustion, and you will see that it is of two kinds. You will see the gunpowder burning and the filings thrown up. You will see them burning too, but you will see them burning otherwise than in flame. They will each burn separately. [The lecturer then ignited the mixture.] There is the gunpowder which burns with a flame, and there are the filings; they burn with a different kind of combustion. You see, then, these two great distinctions; and upon these differences depend all the beauty and all the utility of flame which we use for the purpose of giving out light. When we use oil, or gas, or candle, for the purpose of illumination, their fitness all depend upon these different kinds of combustion.

There are such curious conditions of flame that it requires some sharpness and some cleverness to distinguish the kinds of combustion one from another. For instance, here is a powder which is very combustible, consisting, as you see, of separate little particles. It is called *lycopodium*, and each of these particles can produce a vapor and produce its own flame; but, to see them burn, you would think it was all one flame. I will now set fire to a quantity, and you will see the effect We saw a cloud of flame, apparently in one body; but that rushing sound [referring to the sound produced by the burning] was a proof that the combustion was not a continuous or regular one. This is the lightning of the pantomimes, and a very good one too. [The experiment was twice repeated by blowing lycopodium from a glass tube through a spirit flame.] That is not a combustion

like that of the filings I have been speaking of, to which I must now bring you back again.

Supposing I take a candle and examine it in that part which appears brightest to our eyes. Why, there I get these black particles which already you have seen three or four times evolved from the flame, and which I am now about to evolve in a different way. I will take this candle and clear away the gutterage which occurs by reason of the currents of air; and if I now arrange a glass tube so as just to dip into this luminous part, as in our first experiment, only higher, you see the result. In place of having the same white vapor that you had before, you will now have a black vapor. There it goes, as black as ink. It is now certainly very different from the white vapor, and when we put a light to it you will find that it does not burn but that it puts the light out. Well, these particles, as I said before, are just the smoke of the candle; and this brings to mind that old employment which Dean Swift recommended to servants for their amusement, namely, writing on the ceiling of a room with a candle. But what is that black substance? Why, it is the same carbon which exists in the candle. How comes it out of the candle? It evidently existed in the candle, or else we should not have had it here. And now I want you to follow me in this explanation. You would hardly think that all those substances which fly about London, in the form of soots and blacks, are the the very beauty and life of the flame, and which are burned in it as those iron filings were burned here. Here is a piece of wire gauze, which will not let the flame go through it, and I think you will see, almost immediately, that when I bring it low enough to touch that part of the flame which is otherwise so bright that it quells and quenches it at once, and allows a volume of smoke to rise up.

I want you now to follow me on this point—that whenever a substance burns, as the iron filings burnt in the flame of gunpowder, without assuming the vaporous state—they may become liquid or they may remain solid—they become exceedingly luminous. I have here taken three or four cases away from the candle, on purpose to illustrate this point to you; because what I have to say is applicable to all substances, whether they burn or whether they do not burn, that they are exceedingly bright if they retain their solid state, and that it is to this presence of solid particles in the candle that it owes its brilliancy.

Here is a platinum wire which does not change by heat. If I heat it in this flame, see how exceedingly luminous it becomes. I will make the flame dim for the purpose of giving a little light only, and yet you will see that the heat which it can give to that platinum wire, though far less than the heat it has itself, is able to raise the platinum wire to a far higher state of effulgence. This flame has carbon in it; but I will take one that has not carbon in it. There is a material, a kind of fuel—a vapor, or gas, whichever you like to call it—in that vessel, and it has no solid particles in it; so I take that because it is an example of flame itself burning without any solid matter whatever; and if I now put this solid substance in it, and you see what an intense heat it has, and how brightly it causes the solid body to glow. This is the pipe through which we convey this particular gas, which we call hydrogen, and which you shall know all about next time we meet. And here is a substance called oxygen, by means of which this hydrogen can burn; and although we produce, by their mixture, far greater heat than you can get by the candle, yet there is very little light. If, however, I take a solid substance, and put that into it, we get a great light. If I take a bit of lime, which is a thing which will not burn, and which will not vaporize by the heat, and because it does not vaporize remains solid and remains heated, you will find what happens as to the glowing of it. I have a most intense heat here produced by the burning of the hydrogen in contact with the oxygen; but there is as yet very little light—not for want of heat, but for want of particles which can retain their solid state; but when I hold this piece of lime in the flame of the hydrogen as it burns in the oxygen, see how it glows! This is the glorious lime light which rivals the voltaic light, and which is almost equal to the sunlight. I have here a piece of carbon or charcoal which will burn and give us light exactly in the same manner as if it were burnt as part of a candle. The heat that is in the flame of a candle decomposes the vapor of the wax and sets free the carbon particles; they rise up heated and glowing as this now glows, and then enter into the air. But the particles when burnt, never pass out from a candle in the form of carbon. They go off into the air as a perfectly invisible substance, about which we shall know hereafter.

Is it not beautiful to think that such a process is going on, and that such a dirty thing as charcoal can become so incandescent? You see it comes to this—that all bright flames contain these solid particles; all things that burn and produce solid particles, either during the time they are burning, as in the candle, or immediately after being burnt, as in the case of the gunpowder and iron filings, all these things give us this glorious and beautiful light.

I will give you a few illustrations. Here is a piece of phosphorus, which burns with a bright flame. Very well; we may now conclude that phosphorus will produce, either at the moment that it is burning or afterwards, these solid particles. Here is the phosphorus lighted, and I cover it over with this glass for the purpose of keeping in what is produced. What is all that smoke? That smoke consists of those very particles which are produced by the combustion of the phosphorus. Here again are two substances. This is chlorate of potassa, and this is sulphuret of antimony. I shall mix these two things a l le, and then they may be burnt in many ways. I shall touch them with a drop of sulphuric acid, for the purpose of giving you an illustration of the chemical action, and they will instantly burn. [The lecturer here ignited the mixture by means of sulphuric acid.] Now, from the appearance of things, you can judge whether they produce solid matter in burning. I have given you the train of reasoning which will enable you to say whether they do or do not. And what is this bright flame but the solid particles passing off?

Mr. Anderson has in the furnace a pretty hot crucible—I am about to throw into it some zinc filings, and they will burn with a flame like gunpowder. I make this experiment because you can make it well at home. Now, I want you to see what will be the result of the combustion of this zinc. Here it is burning—burning beautifully like a candle, I may say. But what is all that smoke, and what are those little clouds of wool which will come to you if you cannot come to them, and make themselves sensible to you in the form of the old philosophic wool, as it was called? We shall have left in that crucible, also, a quantity of this woolly matter. But I will take a piece of this same zinc and make an experiment a little more closely at home, as it were. You will have here the same thing happening. Here is a piece of zinc; there [pointing to a jet of hydrogen] is the furnace, and we will set to work and try and burn the metal. It glows, you see; there is the combustion: and there is the white substance into which it burns. And so if I take flame of hydrogen as the representative of a candle, and show you a substance like zinc burning in the flame, you will see that it was merely during the action of combustion that this substance glowed—while it was kept hot; and if I take a flame of hydrogen and put this white substance from the zinc into it, look how beautifully it glows, and just because it is a solid substance.

I will now take such a flame as I had just now and set free from it the particles of carbon. Here is some camphene, which will burn with a smoke; but if I send these particles of smoke through this pipe into the hydrogen flame, you will see that they will burn and become luminous, because we heat them a second time. There they are. Those are the particles of carbon re-ignited a second time. They are those particles which you can easily see by holding a piece of paper behind them, and which, whilst they are in the flame, are ignited by the heat produced, and, when so ignited, produce this brightness. When the particles are not separated you get no brightness. The flame of coal-gas owes its brightness to the separation, during combustion, of these particles of carbon, which are equally in that as in a candle. I can very quickly alter that arrangement. Here, for instance, is a bright flame of gas. Supposing I add so much air to the flame as to cause it all to burn before those particles are set free, I shall not have this brightness; and I can do that in this way:—If I place over the jet this wire gauze cap, as you see, and then light the gas over it, it burns with a non-luminous flame, owing to its having plenty of air mixed with it before it burns; and if I raise the gauze up you see it does not burn below. There is plenty of carbon in the gas; but because the atmosphere can get to it and mix with it before it burns, you see how pale and blue the flame is. And if I blow upon a bright gas flame, so as to consume all this carbon before it gets heated to the glowing point, it will also burn blue. [The lecturer illustrated his remarks by blowing on the gas-light.] The only reason why I have not the same bright light when I thus blow upon the flame, is that the carbon meets with sufficient air to burn it before it gets separated in the flame in a free state. The difference is solely due to the solid particles not being separated before the gas is burnt.

You observe that there are certain products as the result of the combustion of a candle, and that of these products one portion may be considered as charcoal or soot; that charcoal, when afterwards burnt, produces some other product; and it concerns us very much now to ascertain what that other product is. We showed that something was going away; and I want you now to understand how much is going up into the air; and for that purpose we will have combustion on a little larger scale. From that candle ascends heated air, and two or three experiments will show you the ascending current; but in order to give you a notion of the quantity of matter which ascends in this way, I will make an experiment by which I shall try to imprison some of the products of this combustion. For this purpose, I have here what boys call a "fire balloon." I use this fire balloon merely as a sort of measure of the result of the combustion we are considering; and I am about to

make a flame in such an easy and simple manner as shall best serve my present purpose. This plate shall be the "cup," we will say, of the candle; this spirit shall be our fuel; and I am about to place this chimney over it, as it is better for me to do so than to let things proceed at random. Mr. Anderson will now light the fuel, and here, at the top, we shall get the results of the combustion. What we get at the top of that tube is exactly the same, generally speaking, as you get from the combustion of a candle; but we do not get a luminous flame here, because we use a substance which is feeble in carbon. I am about to put this balloon—not into action, because that is not my object, but to show you the effect which results from the action of those products which arise from the candle as they arise here from the furnace. [The balloon was held over the chimney, when it immediately commenced to fill.] You see how it is disposed to ascend; but we must not let it up, because it might come in contact with those upper gas-lights, and that would be very inconvenient. [The upper gas-lights were turned out at the request of the lecturer, and the balloon was allowed to ascend.] Does not that show you what a large bulk of matter is being evolved? Now there is going through this tube [placing a large glass tube over a candle] all the products of that candle, and you will presently see that the tube will become quite opaque. Suppose I take another candle and place it under a globe, and then put a light on the other side, just to show you what is going on. You see that the sides of the jar become cloudy and the light begins to burn freely. It is the products, you see which make the light so dim, and this is the same thing which makes the sides of the jar so opaque. If you go home and take a spoon that has been in the cold air and hold it over a candle—not so as to soot it—you will find that it becomes dim just as that jar is dim. If you can get a silver dish, or something of that kind, you will make the experiment still better; and now, just to carry your thoughts forward to the time when we shall next meet, let me tell you that it is *water* which causes the dimness, and when we next meet I will show you that we can make it, without difficulty, assume the form of a liquid.

A New Source of Gas Supply.—The Rev. Dr. Peter, of Chelsea, Tennessee, illuminates his church and dwelling with gas made out of cotton-seed, with the addition of a little rosin. The cost is said to be trifling and the gas is of excellent quality.

WATER-WORKS OF AMERICA.

NEW YORK CITY.

REPORT OF THE CROTON AQUEDUCT DEPARTMENT.

The report of the Croton Aqueduct Department for the year 1860 has recently been published. The following is a condensed statement of its import. During the year the receipts were as follows:—

Water rents	756,831.89
Penalties	10,337.73
Sewer connections	24,391.00
Permits for vaults	23,241.81
Permits for taps in pipes	2,477.50
Sundries	2,877.78
Total	$820,157,71

The unexpended balances from 1859, with the several appropriations for 1860, are stated in connection with the expenditures in the following table:

	Appropriations, including balances for 1859.	*Expenditures in* 1860.
Croton Water-Works extension	642,108.43	642,108.33
Aqueduct repairs and improvements	22,249.41	17,654.21
Water-pipes and laying	120,109.40	110,032.44
Street expenses and repairing	121,844.17	121,180.00
Sewers, rebuilding, repairing, and cleaning	70,000.65	45,921.05
Wells and pumps, repairing	3,775.48	3,315.62
Russ pavement, improvement	25,242.55	623.37
Statistical tables	868.61	
Salaries	30,000.00	29,629.78
Contingencies	5,000.00	2,774.08
Total	$1,041,638.70	$973,378.98

The above figures exhibit an unexpended balance of $68,259.72, which was added to the appropriation for this year.

The usual examination of the interior of the aqueduct, which is generally made during the month of November, was last year omitted.

After two postponements, made necessary by existing circumstances, the time finally fixed upon for shutting off the water at Croton dam, was eight o'clock on the morning of the 4th of December. At the time the order was given, the water in the receiving reservoir was already twenty inches below the top water line, and in the distributing reservoir it was proportionably lower than the usual height at that point. From close observations and experiments made during the fortnight previous to the 4th December, it became evident that the usual (though dishonest) habit of letting water run waste in dwelling houses and stores, to prevent its freezing, had already been commenced for the Winter, and that it was impossible with such a drain through the outlet pipes, to fill the receiving reservoir to the height deemed necessary before the examination could be entered on with safety. During this time the thermometer was not down to the freezing point, and even the usual inadequate excuse for this criminal waste was wanting. It was very evident that, should the weather become suddenly colder during the time set for repairs, the waste from this cause would be increased, and equally evident, from past experience, that, should this waste be added to the usual consumption during the time the gates were closed, the city would be without water before the examination and repairs could be finished. The last examination in 1859, was made on the 27th, 28th, and 29th October. At the time the gates were closed, the water in the receiving reservoir was eleven inches below the top water line. The thermometer, during the time the water was shut off, stood at 45 degrees (Fahrenheit) and had not yet ranged lower than that point during the Fall. There could have been no waste on the pretext of freezing weather. During 1860 the water in the receiving reservoir stood, as before stated, twenty inches below the top level; the temperature was but little above the freezing point, and there were indications of a still lower temperature day by day. Under these circumstances, it was deemed more judicious to postpone the examination until Spring.*

Had the examination and repair of the aqueduct not been postponed, the break would have occurred at a moment when the supply from the Croton dam was wholly cut off, and the aqueduct in such a stage of repair that, to have let the water on immediately, would have been impossible. With the distributing reservoir entirely empty, and the receiving reservoir nearly so, the city would soon have been utterly without water. The results of such a disaster it is not easy to comprehend. The cause of the rupture of these mains was similar to that which resulted in an accident in the same avenue, near Fifty-ninth street, in October, 1859; though, fortunately, at that time, but one of the mains was broken. These two mains were originally put down in the Fifth avenue in 1842, and were laid at the usual depth below what was, at that time, the grade surface of the avenue. Since that time the grade of the avenue has been changed, and recently the operations for bringing it up to the new grade have been completed. By this new grade, the avenue at this point has been raised thirteen feet. At the place where the pipes were broken, the avenue crosses a piece of wet, low land, and the height of embankment which makes the street, is upwards of twenty-two feet. On either side of this low land, the embankment for the avenue rests upon the solid ledges of rock, which rise above the swampy ground between them. When the superincumbent weight, due to thirteen feet of additional filling, was placed upon the avenue, it forced down the whole of the former roadway a certain depth into the wet or compressible earth between the two edges, while the unyielding base afforded by these ledges prevented a like settlement at the two ends of the embankment. Under these circumstances, it would not require a very great settlement in the centre to cause a deflection in the line of the pipe, greater than that provided for in its joints, and the pipe must therefore give way. It may be asked, why was not this accident foreseen and guarded against, by raising the pipes, so as to correspond with the new grade of the street. The only answer which it is necessary to give, is that an attempt to raise these mains to the height required, before means were provided of supplying the city through other mains, with a quantity equal to that which is brought to us through the two in question, would be fraught with far more danger to the city than any which is likely to result from the most serious accident which could happen to them in their present position. As the supply through these pipes is indispensable to the citizens of New York every hour (as the recent accident has proved), it would be necessary to raise them while full of water, and to keep them in uninterrupted flow during the whole of the work. During the whole of the operation of raising them they would be more liable to an accident than they are in the present position; and there would be, of necessity, certain stages of the work in which, if a break in either pipe should take place, a disaster might occur, in comparison with which that of the 5th of December would be a trifle. The board, has, therefore, not felt, nor does it now feel at liberty to disturb these mains, except under the safeguard of a full provision against the results of possible accidents. This provision is now being made, by the laying of a main pipe from the receiving reservoir to and through the Fourth avenue to Thirty-eighth street. The pipe is four feet in diameter, and will deliver within a fraction as much as both of the two three-feet pipes in Fifth avenue. When the work of laying it is completed, and it is connected with the distributing reservoir and with the general pipe distribution below Forty-second street, whatever alterations in the position of the pipes in Fifth avenue may be deemed advisable by the board, can be made, thoroughly, permanently, and without danger of accident or interruption of the usual supply of water to the city.

Under the head of Croton aqueduct extension, the chief work specified is the new reservoir. This is in an advanced state, the excavations and embankments being nearly completed. It is believed that no similar work has ever been executed in a better manner. Owing to the existing difficulties in relation to the contract for the gate houses and the continuance of a legal controversy which threatened to delay their commencement indefinitely, the board deemed itself called upon to apply to the legislature for a special law, which would enable it to go on with the work. A law to that effect was passed April 16, 1860, and, in accordance with its provisions, arrangements were immediately made for the rapid prosecution of the work.

Another important work in progress is the improvement at the High Bridge, over which the water is now brought through two three-foot pipes, laid as inverted syphons. These two pipes were intended to bring across the bridge one-half of the quantity which could be delivered by the aqueduct, but are capable of doing so only by an arrangement at the gate-house, which gives them a head of five and a quarter feet. The improvement of the High Bridge consists in putting down a pipe large enough to bring over all the water which can be delivered into it through the aqueduct, with a loss of head of but one foot.

The pipe is of wrought iron, and ninety and one-half inches in diameter. This wrought iron pipe is supported by cast iron stancheons and saddles, placed between the two three-feet pipes now there, and at a height sufficient to allow two feet of clear space between it and the old pipes, for the free movement of workmen in repairs, etc. Proper provisions for the contraction and expansion of this pipe is made, by rollers throughout, and by moveable joints near the extremities. It will be connected with the gate-houses at each end in the same manner as the present pipes are connected. It is not proposed to remove the present pipes, but arrange them in such a manner that they can be used at any time, either in conjunction with the new pipe or separately. Opportunity for repairs on either of the pipes can then be had, whenever needed, without suspending the flow of water into the city.

The contract for the wrought iron plates for this pipe embraces the supply of 648,000 pounds of flange iron. The amount of the contract is $26,936.12. Nearly all the iron under it has been delivered.

The contract for the mechanical construction of the pipe embraces all the works and expense made necessary, from the time of the plates in this city to the completion of the pipe in its place on the High Bridge. This contract will amount to about $50,000. Of the pipe, about 1,500 feet are already on the bridge, and of this quantity a length of about 350 feet is joined together and in its place. The work has been prosecuted with vigor and judgment, and with a degree of excellence that can not be surpassed. As in the case of the gate-houses for the new reservoir, the details of this work at the High Bridge are considered worthy of more extended notice than can be given in this report. It is proposed, therefore, to include them fully in the special communication, descriptive of the gate-houses.

The board is now engaged in putting down a new main pipe to connect the receiving reservoir with the general distribution of the city below Forty-second street. This pipe is to be laid from the main effluent gate-chamber on the east side of the receiving reservoir, through Eightieth street to Fourth avenue, and thence to Thirty-eighth street. Its diameter is four feet, and its length 13,700, or 2.594 miles. This additional pipe has become necessary to meet the increased consumption of water in the city, and also to improve the connection between the reservoirs, and it will overcome the great loss of head from friction in the two three-feet mains in Fifth avenue, and when it is connected with the distributing reservoir, *and in operation*, the additional elevation of water there will be from ten to eleven feet. This main is also necessary as a safeguard in case of accidents which might destroy the connection between the receiving reservoir and the general pipe distribution. The contract for laying it embraces the necessary excavation and embankment for the bed of the pipe, its unloading at the wharves, hauling it to its site, and putting it in place, and performing all the necessary work for its completion. The estimated amount of the contract is $67,288.35.

During the past year there have been laid 26,331 feet of 6-inch, and 6,602 feet of 12-inch pipe. The number of fire hydrants has been increased, making a total, in all, of 2,307 throughout the city. Drinking hydrants have been placed in various parts of the city, where such an accommodation was deemed most necessary. The number of buildings throughout the city subject to water rents, as shown by the books of the department, is 58,735.

Of street repairs a very large amount has been made during the past season—twenty-two gangs having been employed in different sections of the city. Notwithstanding this great expenditure of labor on street pavement, the board cannot refer with any degree of satisfaction to its results. The system of repaving only the more sunken portions of the carriage-way is found to be of but temporary benefit. In a few weeks other portions of the pavement give way, and the street is soon in as bad a condition as before the repairs were made. In the opinion of this board, it would be better economy in most cases to take up the whole of the pavement from gutter to gutter, and relay the same on a properly renewed foundation. The substitution of trap-blocks for the cobble-stone pavement, in some of the leading thoroughfares, has, as was anticipated, resulted in a saving of the expense heretofore incurred annually, in attempts to keep them in proper repair.

There are over 107 miles of sewers in the city, with a proportionate number of receiving basins and culverts.

* [An extended account of the accidental bursting of the great Croton mains is given. This was noticed in the JOURNAL at the time of its occurrence, on page 190 of this volume.—ED.]

In these, as a vast receptacle, there lodges much of the filth of the streets and gutters, and soil from house connections, &c. To remove this offensive matter, and to keep the sewers and appurtenances in good repair, involves much expense, and this expense must necessarily increase with the annual increase in the number and extent of the sewers. For the construction of sewers, the city is reimbursed by the collection of assessments. There was built during the year,

By contract	35,834 lineal feet.
By private expense	1,354 lineal feet.
Making a total of	37,188 lineal feet,

—or seven miles and 228 feet.

The board recall attention to their recommendation for an established system of sewerage up town, to avoid the present difficulties of sewerage down town, consequent upon no system of drainage having been first established.

The granting of permits to construct vaults having been placed by law under the control of this department, the attention of the board was early called to the practice which had prevailed, of extending them far beyond the curb line. In consequence of this encroachment on the streets by the walls of neighboring vaults, the operation of repairs to sewers and water-pipes has been impeded, and the proper position of fire-hydrants materially affected. To prevent, if possible, further injury from this cause, the board found it necessary to refuse permits for the construction of vaults beyond the curb line. This rule has been generally approved of, and its evident importance has induced the board to continue it in force.

During the past year four wells have been filled, and fifty wells covered over. Those filled up were of no further use, and in such a state as not to be available without building. The wells that were covered over were in available condition; they were protected in such manner that should any necessity arise for their use, they could be brought into operation in a few hours. There are now standing in the city 140 pumps. It is the intention of the board to maintain them in good working order.

FREDONIA, N. Y.—Natural gas-works, built at the foundation of the world. The company say, in the report, that the works were *built by themselves*, and are quite satisfactory. They add that the retorts are built of shale and sandstone, set in benches of from one to ten hunhundred feet in length, and made (vertical retorts, we suppose,) by the Great Architect of the Universe. The supply of gas was so great at the date of the report that they required no meters; supplying their customers *ad libitum*, at a fixed annual price, on the principle of the water companies, but as the consumption was found to be running up pretty fast, they were about purchasing meters. Gas holders built in New Jersey; use pumps instead of exhausters (probably Worthington's); the kind of coal used in generating the gas is reported to be unknown, (probably it is!) The gas is cleaned before it is supplied to consumers, and comes from the vein more pure than the best coal-gas. Lighted up for the first time Jan. 1, 1859, since which, consumers have been supplied directly from the vein in the rock, distant ¾ of a mile from their office. Mr. Preston Barmore, the Secretary and Superintendent of these interesting works, promised us nearly two years ago a history of them, but to this moment, it has not arrived. Perhaps it was sent round via South Carolina, which may account for its delay.

EASTON, PA.—Coal-gas works, built by Philip P. Deily, with iron retorts, and Code, Hopper & Gratz's meters. Gas-holders from Deily. Use Westmoreland coal, costing $6 70 per ton. Make about 6,000,000 cubic feet of gas annually. Owe nothing, and divide 8 per cent. Not a bad showing.

CITY OF LONDON GAS COMPANY.—A difficult erection of gasometer column and framing has been completed at this company's works, Dorset-Street, Salisbury Square, by Messrs Nestwood & Wright, of Dudley. The machinery was planned and arranged by Mr. T. Wright, one of the firm, and his foreman Mr. Wm. Werry. The spot is surrounded with houses and buildings. The Gas Company provided the men with a supper at the Rose and Crown, Dorset Street, presided over by the company's secretary.

THE BELMONTINE LAMP.—A patent table lamp, called the Belmontine, has been invented, giving a light equal to six candles, at a cost of a farthing an hour; the wick lasting three months and requiring no cutting.

FOREIGN NEWS.

ENGLISH PATENT FOR PURIFYING GAS.

A patent has been granted to John Stenhouse, of London, for "*Improvements in purifying coal-gas*," in which the invention consists in purifying the gas from bi-sulphuret of carbon, by treating the gas with spirits of wine, (the ethylic alcohol of the chemists,) or with wood spirit, (the methylic alcohol of the chemists,) or with fusel oil, (the amylic alcohol of the chemists.) The solutions of potash, soda and ammonia, with their sulphurets and carbonates, dissolved in the before mentioned alcohols, are also employed, either singly or in combination. To these alcoholic solutions are likewise added rectified coal-tar, naphtha, the oils of coal-tar, and any other suitable liquid hydro carbons, or essential and fixed oils. The gases are treated with these liquids by means of a washer, or any other suitable mechanical arrangement. The bi-sulphuret of carbon is dissolved by these liquids, forming the well known series of acids, viz.: the xanthic, the xanthomethylic, and xanthamylic; and if alkaline bases are present, corresponding salts of these acids, containing potash, soda and ammonia, are produced.

When these liquids have absorbed, or are become saturated with bi-sulphuret of carbon, they are removed from the apparatus; and by cautious rectification, advantage being taken of the differences in volatility of the alcohols and bi-sulphuret of carbon, these substances are separated from each other, and thus the greater portion of the spirits and bi-sulphuret of carbon are recovered.

When alkaline solutions are employed, it is necessary to neutralize the alkalies with acids before begining to rectify, and in this manner the greatest portion of the alkali is also recovered.

REPORT ON THE GAS OF THE SURREY COMPANY.—Dr. J. Northcote Vinen, the medical officer of health for the St. Olave's district, Southwark, London, transmits the following report on the gas supplied by the Surrey Consumers Company for the last four weeks:—

Week ending	Number of Observations	Maximum Light. Candles.	Minimum Light. Candles.	Average Light. Candles.
Nov. 24	4	13·20	12 22	12 91
Dec. 1	4	13·77	10·66	12·21
" 8	4	14·12	12·83	13·51
" 15	4	15·81	14 21	14·84

The value of the hydrocarbons varied from 4 to 5 per cent. Carbonic acid was present to the extent of 1 per cent. On the 4th, 6th, and 14th inst., there was distinct evidence of the presence of ammonia. The maximum pressure was three inches and two-tenths; the minimum four-tenths of an inch; and the average ordinary pressure was one inch.

GAS IN ENGLAND.—The Swindon Gas and Coke Company have reduced the price of their gas to 6s. 6d. per 1000 feet.

The small town of Pewsey is to be lighted with gas; a company having been formed for this purpose.

In Shipley the gas consumers are agitating for a reduction in the price of gas, which the company refuse for the reason that their average dividends have not exceeded 5½ per cent.

COLLIERY EXPLOSION IN ENGLAND.—A shocking explosion has taken place at Hetton Colliery, near Dunham, whereby twenty miners are said to have lost their lives. This colliery is the property of the Hetton Coal Company, and is situated about 9 miles south of Sunderland.

LIGHTING PASSENGER CARS WITH GAS.—At Altoona, the Penn. R R Co. have a building devoted exclusively to their gas apparatus, containing 20 receivers, each of which is ten feet long, 12 inches in diameter, and which will sustain a pressure of 900 pounds to the square inch. By the aid of one of Merrick & Son's gas pumps, the gas received from the Altoona Gas Works is forced into the receivers, to a pressure of about 600 pounds. By means of pipes, it is conducted to the cars, and there enters a receiver on each car, (7ft. 6 inches high, 14 inches diameter,) which, with a pressure of 500 to 600 pounds, contains sufficient to suppply two 6-foot and one 3-foot burner, 16 to 18 hours, or one round trip. The use of gas has proved more satisfactory and popular with the passengers, but is probably much more expensive than oil or candles.

PRESERVATION OF GAS AND WATER-PIPES.—A workman of Paris, it is said, has just discovered a means of preserving water and gas-pipes from rust, by enveloping them in a thick coating of clay. The city of Paris is said to have granted the man a pension for life.

ANSWERS TO CORRESPONDENTS.

F. J. R. of Pa.—*We have seen samples of the oil. It is very variable in its external character; some of it being of a light color and almost inodorous, while other samples are dark and cloudy, and evolve a very disagreeable smell. More or less water accompanies the crude oil.*

P. W. of Maine.—*In considering any new process, two very important questions present themselves, viz.—1st. Is it really a valuable improvement? and 2d. Will it pay?—As regards your invention, we can answer the first question affirmatively, but we incline to the opinion that a negative answer must be returned to the second. You have got the idea, but have not yet sufficiently matured your plans. However, do not let this discourage you, for every invention of any value has been the result of close application and intense study, and final success has been achieved only after many disappointments.*

O. B. S. of Del.—*It will expire in about two years.*

L. B. T. of Texas.—*Do not touch fluid under any circumstances. It is expensive, disagreable to have about, and exceedingly dangerous. Where there is no gas, coal-oil is the cheapest, cleanest, and altogether the most satisfactory illuminating agent you can employ. There ought to be a law entirely prohibiting the use of burning fluid, as scarcely a week elapses that fatal accidents are not announced, caused by its explosions.*

U. W. of N. J.—*We cannot find any evidence to the contrary.*

H. S. C. of N. H.—*It will appear in our next.*

J. S. of N. C.—*The material of which Greek and Roman lamps were composed, was chiefly terra-cotta, although some of the better sort were made of bronze, and even of silver and gold. Some iron and glass lamps have been discovered among the ruins of Herculaneum, and probably many more implements of iron would be found, but for the perishable nature of the metal.*

Sale of the Astoria N. Y. Gas-Works.

Pursuant to advertisement in this JOURNAL, the Gas-Works at Astoria, Long Island, opposite this city, were sold at public auction on Wednesday, March 6, at 12 o'clock, noon, at the Merchants' Exchange, by Anthony J. Bleecker & Sons, auctioneers. There was a fair attendance of buyers.

The auctioneer stated that the land consisted of eight lots, each 25 feet front and rear by about 100 feet deep, fronting on the East river, with water-grant for dock, &c. The buildings are of brick, and contain two benches of three iron retorts each; tank and holder about 32 feet diameter. Nearly 100 meters are set, and perhaps a mile and a half of mains, with fixtures and appurtenances complete.

The Company possess the exclusive privilege to lay pipes and sell gas for twenty years to come, at not over $4 per 1,000 cubic feet, from which price a discount of five per cent is allowed for prompt payment. They have also a contract with the village to light the public lamps at $28 each per annum, and have now 17 lamps.

The terms of sale were ten per cent. cash down on day of sale, together with the auctioneer's fee of $30; 40 per cent. to be paid on 1st of May, when possession will be given, and balance on 1st November next, with interest.

Thus informed, the audience were asked for a bid. The first offer was $5,000; the second, $5,500; the third, $6,000; from which the bids ran up rapidly to $10,000, when they narrowed down to a spirited competition between two bidders, who carried it up to $12,000, at which one of the two dropped off, and the other having called $12,100, it was struck down to him at that sum.

The name of the purchaser was W. Crosby, said to be the proprietor of an independent Water-Gas Works at Brooklyn, N. Y. But the sequel of it all is that Mr. Crosby did not perfect his purchase by paying the first 10 per cent., nor even the auctioneer's fee, and the works were, consequently, resold at same place, on Saturday 16th March, by same auctioneer, for account of former purchaser. The only two bidders were Mr. J. J. Halsey, one of the Directors of the Astoria Company, and Mr. Howard, Secretary of the Manhattan Gas Company. After a sharp competition, the works were struck down to Mr. Halsey for $10,375, being $1,725 less than they brought at first sale.

COST OF THE WORKS.

We are told that the following is the cost of the Astoria, N. Y., Gas-Works:

Land	3,200 00
Novelty Works	4,613 19
Mains	3,785 73
Meters and service pipes	1,793 08
Do	171 50
Mason work	2,350 00
Carpenter work	326 38
Lumber	891 30
	$16,631 21

THE AMERICAN GAS-LIGHT JOURNAL is published on the 1st and 15th of every month and is specially devoted to

LIGHT, HEAT, WATER-SUPPLY, AND SEWERAGE.

Its purpose is to ascertain and make known all new discoveries in the science and economical application of LIGHT, and promote thereby the interests of companies and consumers; to encourage and aid the introduction of PURE WATER from Lakes and Rivers into TOWNS and Cities, and to improve the system of SEWERAGE, VENTILATION, and DRAINAGE everywhere.

Incidentally with these results, the business of all Gas and Steam Fitters and Plumbers; the erection of Gas-Works and Water-Works; the consumption of Coals, the manufacture and consumption of Coal-Oils, the manufacture of Gas-Pipe, Water-Pipe, Steam-Pipe, Gas Fixtures, Gas-Meters, Water-Meters, Retorts of iron and clay, and their varied apparatus; of Drain Pipes, Ventilating, Heating and Dredging Machines will be increased immeasurably.

THERE ARE 20,000 CITIES AND TOWNS IN THE UNITED STATES, CAPABLE OF SUPPORTING GAS-WORKS, WHILE THERE ARE NOT 400 GAS-WORKS IN OPERATION IN THE WHOLE COUNTRY!!!

New works are now springing up, however, every week, and they will continue to increase rapidly hereafter.

Advertisers of Gas-Coals, Coal-Oil, Water, Steam, Sewerage and Ventilating apparatus, and of Iron and Brass manufactures, &c., will find the AMERICAN GAS-LIGHT JOURNAL the most desirable and efficient medium of any in the United States, going, as it does, direct to the parties interested in those subjects.

TERMS—CASH IN ADVANCE.

SUBSCRIPTION—In the U. S. and British Provinces, $3 per annum.
Do. To English subscribers..... 12s. "
Do. To French and German subscribers, 16f. "
payable to our Agents or Bankers, as below.

ADVERTISEMENTS—According to position and space occupied. For particulars of which please address the Proprietor.

☞ Remittances by mail to be addressed to the proprietor,
JOHN B. MURRAY,
ROOMS of the AMERICAN GAS-LIGHT JOURNAL,
Nos. 254 and 256 Canal street, NEW-YORK CITY.

AGENTS OF THE AMERICAN GAS-LIGHT JOURNAL.

FOREIGN.

Germany..... ..... B. WESTERMAN & Co., of New York.
Great Britain,.. WHEATLEY, STARR & Co., 156 Cheapside, London.
TRUBNER & Co., London.
Paris, France..... LE JOURNAL DE L'ECLAIRAGE AU GAZ, 24 Boulevard Poissonnière.

BANKERS IN LONDON.

WHEATLEY, STARR & CO., 156 Cheapside, to whom all payments for our account must be made; and who will forward to us all packages, samples and orders, on payment of charges.

DOMESTIC.

The AMERICAN GAS-LIGHT JOURNAL can be purchased of all the newspaper and periodical dealers in the United States and Canada

THE
AMERICAN GAS-LIGHT JOURNAL.
PUBLISHED ON 1ST AND 15TH OF EVERY MONTH.

PROPRIETOR, JOHN B. MURRAY. } { EDITOR, C. ELTON BUCK.

MONDAY, APRIL 1, 1861.

The question is often asked—What are the qualifications necessary to constitute a successful gas-engineer? In view of the increasing number of gas-works in the country, and the growing attention which is paid to the subject of artificial illumination, the question is one of some importance; and in considering it, it will be necessary to regard the nature of the duties connected with the superintendence of the manufacture of gas. It would be impossible in our limited space to enter into any details of the various requirements which should be possessed by a thorough engineer. We can but briefly reflect on the more prominent points of interest which present themselves, and take a hasty glance at the several sciences, some of whose laws are observed in the familiar operations of the gas-works.

As the generation, condensation, and purification of gas are essentially chemical operations, it follows that some knowledge of the principles of chemistry should be understood, so as to offer an intelligible solution to these otherwise mysterious processes. To the uninitiated it seems a perfectly simple matter to place a charge of coals in a retort, and to conduct the resulting gas through the hydraulic main, washers, condensers, purifiers, &c., and so on to the holders; and they would see very little necessity for any scientific information. If with different kinds of coals, and in all kinds of weather, these operations progressed uninterruptedly, perhaps no great amount of erudition would be requisite; but it must be remembered that oftentimes circumstances will occur, which are enough to perplex the most skilful engineer, and to occasion no inconsiderable degree of study as to their probable cause. It is in times like these, if at no other period, that chemical knowledge is required to account for the anomalous action, and to offer a reason therefor. This, however, is but one instance: numerous others might be mentioned where some knowledge of the principles of chemistry would be necessary. It must be apparent to the minds of all candid persons, that an operation based entirely upon chemical laws must be conducted by one having some information of the science.

The manifold processes connected with the manufacture and distribution of gas render a certain knowledge of the *rationale* of mechanics indispensable; and as this is an exact science, fortified by figures and rigid laws, an acquaintance with it presupposes some familiarity with mathematics. Indeed, these sciences play a very important part in the minutiæ of gas-making, and one who has not an aptness in mastering their details, can never rely on becoming an expert engineer. A mere glance at any practical treatise on the art of gas generating, will afford ample testimony of this fact; and it cannot be ignored. Take for example the theory of the distribution of gas, and the principles regulating its flow through the mains and smaller pipes. It will be seen that these operations, which take place with a beautiful regularity, are clearly defined by certain laws; and in order to properly comprehend these laws, considerable mathematical information is requisite.

The frequent repairs which are necessary to be made in gas-works, render a knowledge of mechanical trades of some importance. A competent engineer must be somewhat acquainted with the art of building, and should be able to furnish proper designs for enlargements and construction. Within the past few years many new and improved plans for the construction of retort houses and other parts of gas-works have been devised, and these have been principally the result of the study and experience of intelligent engineers.

A gas engineer should thoroughly understand the principle and operation of the gas-meter in all its details. Too much stress cannot be laid on this point; for this instrument being the sole arbiter between the producer on the one hand, and the consumer on the other, is often the subject of disputes and doubts as to the accuracy of its registration. Probably more complaints are made to engineers on account of fancied wrongs attributed to the meter, than to any other cause. In order to give an explanation of these apparent and generally imaginary discrepancies, it is absolutely indispensable to possess an accurate knowledge of gas-meters, and to be able to discern any irregularity or incorrectness in their indications.

There is another subject which many engineers in this country are apt to ignore, but which nevertheless should receive its due share of attention. We refer to that of photometry. On page 237 of this volume we spoke of the importance of the daily use of the photometer as a matter of justice to the consumer, whereby he might be able to satisfy himself of the quality of the gas he pays for. The science of photometry has received too little consideration from gas engineers in this country; and it is time that a reform were inaugurated. We have perceived some indications of an advance in this respect recently, but the reform is by no means as rapid as the importance of the subject demands. In order to obtain unvarying results in photometrical experiments, it requires careful manipulation and an experienced judgment. These points should be familiar to gas-engineers, and apart from other considerations, a desire to be perfect in all the details of the profession, should be a strong incentive to efficiency in photometry, as well as in the more familiar branches of the art of gas making. In addition to the requirements already enumerated, an expert engineer should possess some practical information regarding gas-fittings and burners, which are too little understood.

A number of other minor matters might be instanced, in which it would be well for a superintendent of a gas-works to be versed in, but as intimated before, we can take but a rapid glance at the subject, and do not pretend to treat it in detail. It may be stated that as various establishments throughout the country are under charge of workmen who have no knowledge of the sciences above referred to, no education is requisite, and that a certain amount of practical experience only is needed. We are aware that many small works in villages are managed by unskilled laborers, who conduct the operation to the satisfaction of all parties concerned. This, however, is no argument against the truth of what we have urged. A common sense view of the case proves the contrary. Gas-making is a complex operation, involving the principles of various sciences, and it is plain that one who would be proficient in his calling must be well grounded in his qualifications. As an evidence of this we could point to numerous engineers in several of our large cities and elsewhere, whose success in their profession is second only to the liberal amount of varied information they bring to bear upon the minutiæ of their operations, and who have attained their present eminence by minute attention and close study of even the most unimportant details of the manufacture of gas.

GAS MANUFACTURE—IS IT A MONOPOLY?

In our last issue we sketched briefly the answer to this question as it relates to Brooklyn, our little sister city across the river. By a combination of circumstances, a business second to none of its kind in this hemisphere; a monopoly as profitable, as valuable, as certain, as any man could desire, has been broken up, and with the rapidity of a wizard's wand a rival has sprung to the field, formidable, if not invincible. That monopoly is gone. And now for an answer to the question as it relates to New York.

First came the old New York Gas-Light Company in 1823, and settled down quietly for a snug little business below Canal street, when that thoroughfare was the boundary of civilization below, and a barren waste above. In the course of time—seven years later—the Manhattan Gas-Light Company made its unwelcome appearance with its venturous proprietors, and proposed to share with the pioneer of gas, its glory and its gold. But no. Jealous of their vested rights, the ancient Company frowned upon the bold intruders, and denied the justice of their pretensions.

The records of the Board of Aldermen of 1830 contain the angry controversy of the two Companies, which, after a bitter warfare, was succeeded by a treaty of peace, based upon a division of territory, which has been mutually and faithfully observed.

The new Company labored for years under great disadvantages for want of custom and in a sparsely settled district. Its stock fell to 30 per cent., and its vitality almost went out with its gas, until falling into abler and stronger hands, its fortunes gradually revived with an increase of population and commerce, and now under the management of one of the most accomplished of his profession, as he is one of the best of men, the stock of the Manhattan Gas-Light Company rules at 180 per cent. upon its par value.

The extended territory and unparalleled success of the Manhattan Gas-Light Company have long been an eye-sore to gentlemen filibusteringly inclined, who have licked their lips in vain at the unctuous bone thus held so finely by the great mastiff, and various and sundry have been the attempts to encroach upon its domain.

But until recently, no step has been taken serious enough to arrest the notice of the Company. There are now two armies marching to the field, one of which has assumed a status sufficiently defined to attract notice, while the germ of the other is rapidly maturing, and let the Oracles of the Temple ignore them as they may, neither is to be despised.

The first of the invading hosts is a legally chartered corporation, known as the Metropolitan Gas-Light Company, the offspring of one SHARPE, it is said, who sold and transferred it to a speculator named JAMES B. TAYLOR, identified with sundry profitable jobs that stamp him shrewd and rich.

Taylor found purchasers for his charter at a cost of $84,000, leaving some $50,000, perhaps, in his pocket, as make-weight for his pains. Gentlemen of respectability, means, and position are now proprietors of this Company. They are not black-mailers. They are progressing with the work, we believe, as a commercial enterprise, and mean to insist upon an assumed right to share the Manhattan Company's district, precisely as the Manhattan Company did that of the New York Company in the days of old. So much for Invader No. 1.

No. 2 is a nondescript. On pages 188 and 205 of this volume we noticed the organization of a Company under the title of the "Hydrogenated Fuel Company," which had taken the city by surprise, having obtained a grant from the Common Council and Mayor for opening the streets to lay mains, before it was publicly known that their certificate had been filed in the State office.

Never was a secret so well kept—never, perhaps, were the "parties of the second part" *so well paid for keeping one.*

The Company, with the *hydra-genus* name, proves to be the Keystone Water-Gas Company of Philadelphia, which have kept that naturally quiet village in a state of uproar for a year past. It seems they are bent upon "bearding the lion in his den," for it is asserted that they mean to push their project into the very heart of the island. The name of a well known capitalist is identified with this concern, and it is said—we give the rumor as we heard it—that the sum of one hundred thousand dollars has been offered to secure the re eal of their grant. But, who can bribe New York aldermen!

What these two competitors will amount to, is not yet known. They are charged with being black-mailers, and they deny the charge. All that remains for us to say in the premises is, that they are here at our very doors. When the fight comes, with one or both and the present company, it will be a bitter one. All have money; one has the field and money, too, which is an advantage. Movements similar to these are progressing in other cities, and we shall record them as we have space and leisure. No city should have more than one Gas Company, and we feel sure that none will have more, unless competition is invited or defied.

THE SILENCE OF GAS COMPANIES.

Why is it that the great majority of the gas interest refuse to print reports of their business? Is it that they make too much, or too little, money? We would like to have this question answered; for while railroad, insurance, and other corporations publish regular reports of their affairs, the Gas-Light Companies remain silent.

It is the opinion of some of the ablest and shrewdest of the officers of gas-works, that semi-annual statements of their affairs should be made to the shareholders at meetings convened for the purpose, as is done in England. Such a course would substitute for a natural suspicion from their present silence, a general confidence in the honest administration of their affairs. It would lull the irritation of consumers and effectually suppress competition.

The next step should be to keep down the price of gas to a point which would yield ten per cent. dividends, and no more: an ample return for the capital invested. Extra dividends are all wrong. The heavy taxation of a necessity, like light, is nothing less than an outrage upon humanity. We will go any honest length to protect the rights of Gas Companies, but the practice of demanding excessive price from the many to enrich the few, in this or any other monopoly, is an injustice.

Gas-light should be plenty enough and cheap enough to find its way into every poor man's house. It should be the cheering light for the needle-woman and the solace of those who expend their lives at labor in the long hours of the night.

In connection with this subject, we call the attention of our readers to the interesting letter of Robert G. Courtenay, Esq., President of the Louisville, Ky., Gas-Light Company, and to his able report in this Journal. His remarks are eminently creditable to him, and we now look to the Manhattan and New York and all other important Gas-light Companies to follow suit, and give us their reports to publish.

THE WATER-GAS.

We would call the attention of our readers to the letter of Dr. J. Milton Sanders, published in another column, in reply to our remarks, on page 268, concerning the value of his patent process for making water-gas. It will be seen that Dr. Sanders refers to actual experiment to prove the permanence of gas made by his method, and he is satisfied that its luminous properties are retained better even under the influence of severe cold, than is the case with coal-gas. Notwithstanding the accepted view of this subject, we desire to treat it with the utmost fairness, and to allow Dr. Sanders an impartial hearing. For the sake of those interested, we would be glad to see the process proved to be a success, and we shall watch the results of the efforts to put it into practical operation with great interest, and be the first to announce the result.

BUSINESS DEPARTMENT.

Messrs. Edward Cockey & Sons, of Frome Selwood, England, advertise their patent Gas-Valves and other apparatus. It is probable that the recent reduction in patent fees, placing British subjects on a footing with our own citizens, will increase the number of patents of valuable inventions, similar to that advertised by Messrs. Cockey & Sons.

Messrs. Warren & Banks' advertisement of their patent water-gauge, will interest all who use steam-boilers. We have seen this guage in use at the Manhattan Gas-Works, and understand the orders for them are increasing daily.

The notice of Messrs. Mitchell, Vance, & Co's new Electric Gas-Lighter, will interest so many of our readers, that we need hardly allude to it again, further than to advise all who wish to see it to call at 620 Broadway and do so.

The advertisement of the Florence Iron Works appears in this number. This establishment executes orders for the largest sized mains, both gas and water, and the proprietor, Mr. Joseph G. Jones, has the experience and ability to fill contracts with promptness.

We would call attention to the letter of Mr. Hulett in another column, referring to Messrs. Code, Hopper, & Gratz's meters.

MESSRS. MITCHELL, VANCE & CO.'S PORTABLE ELECTRIC GAS LIGHTER.

We witnessed, a few days ago, the application of a most useful and successful invention for the purposes of daily life—an invention that will find its way wherever gas-light is used, and will entirely supersede the use of tapers, alcohol torches, paper alumettes, and all similar nuisances.

The apparatus consists of a brass rod about 12 inches long, with an insulated handle, on which a small glass disc revolves between two little pads of leather, producing sparks, which pass up the brass rod, and this being touched to a short piece of wire attached to the burners, lights the gas at each burner instantaneously.

The whole thing is so simple, so neat, so economical, and so necessary to the comfort of every family as to commend itself universally. It is the intention of Messrs. Mitchell, Vance & Co. to sell the apparatus at a price that will place it within the reach of every body, instead of insisting upon a patentee's right of exacting exorbitant rates.

An intelligent illustration of the Electric Gas-Lighter is being prepared for, and will appear in an early number of this Journal, exhibiting Biddy in the act of lighting the gas, the first evening after landing from old Ireland, proving not only the entire simplicity of the apparatus, but the utter impossibility of a mistake.

For Hotels, Theatres, Steamboats, and Railroad Cars, the Electric Gas-Lighter will be invaluable, and those interested should call and see the apparatus at Messrs. M., V. & Co's Warerooms, No. 620 Broadway.

CORRESPONDENCE.

THE WATER-GAS.

To the Editor of the American Gas-Light Journal:

In the March first number of the Gas-Light Journal, there is an editorial which I think does injustice to the water-gas. It appears that you entertain doubts about the permanency of the water-gas. It is natural that this subject should have claimed my attention at a very early part of my experiments upon this gas. I satisfied myself of the permanency of the water-gas by the following experiments: I coiled about fifty feet of gutta percha tubing in a suitable basin, and surrounded it with pounded ice and chloride of calcium. In this the mercury of the thermometer became solid, indicating that the degree of cold was at least forty degrees below zero, F. Through this pipe I passed a stream of water-gas, and when it issued therefrom it burnt as brilliantly as it does when issuing from the gas-meter at ordinary temperatures. Coal gas passed through this tube burnt with a bluish, non-luminous flame, and deposited the carbonaceous matter that renders it luminous in the tube. Is water-gas as permanent as coal-gas? I passed the water-gas through absolute alcohol. Had the carbonaceous matter, which imparts luminosity to it, been held there simply in suspension, the alcohol would have dissolved it, yet the gas burnt as brilliantly as ever.

These experiments prove that the water-gas promises more permanency than coal-gas, while its superior light proves that it contains a larger per cent. of heavy carburetted hydrogen.

It has been asserted by interested persons that the water-gas is really nothing more than the gases resulting from the decomposition of water, *mixed* with rosin-gas. Admitting that this were true, (which is not the case,) there would still be a great saving over coal-gas. As one thousand cubic feet of water gas requires the use of but twenty pounds of rosin, is there not a wonderful saving over either coal or rosin-gas? To make the same amount of rosin gas, it would require over 160 pounds of rosin; therefore, if water-gas is rosin-gas, "adulterated,"—as has been asserted,—I would simply say that this is just the species of adulteration the public want.

But water-gas is not rosin-gas adulterated, or even admixed with the carbonized gases resulting from the decomposition of water. On the contrary, there is more homogeneity in it than there is in coal-gas. It has been found that rosin-gas will not be produced under the circumstances in which water-gas is generated; for if the rosin be allowed to flow on the heated coal *per se*, at the peculiar temperature necessary to produce the best water-gas, it is not resolved into illuminating gas at all.

All the proprietors of the water-gas require, is that a fair and disinterested examination of their gas may be made by the various Gas Companies who may feel interested in adopting it. All the facts they may require will no doubt be given them at either Aurora, Indiana, or at Malden, Massachusetts.

Censure, no matter how vehement it may be, will not serve the purpose of retarding the adoption of the water-gas among persons possessed of even ordinary discernment. If the gas is the great imposition it is so industriously represented to be, the most certain way of destroying it would be to treat it with contemptuous silence, and it would die of itself. The truest method of sustaining a humbug, is to keep it before the public by violent invective, for in all cases persecution only excites sympathy. It is silence that is the certain bane to all impositions; for if they are not self-sustaining they will speedily fall of their own rottenness. The proprietors, therefore, do not require that the water gas should be bolstered up by fulsome puffs; for while they feel that this course would really injure their cause among discerning persons, they are at the same time aware that a really meritorious thing rises best by the silent eloquence of its own merits. Respectfully.

J. Milton Sanders.

New York, March 27, 1861.

BURLINGTON, N. J., WATER-WORKS.

To the Editor of the American Gas-Light Journal:

I received a number of your Journal, by which I perceive you wish to have information concerning our water-works at Burlington, N. J. I will furnish such information as I am possessed of, the works having lately come into the hands of the present Company. It was chartered and built in 1804; supplied by springs one and a half miles from the city; enlarged about 1838, and an increased supply pumped into tank from Delaware

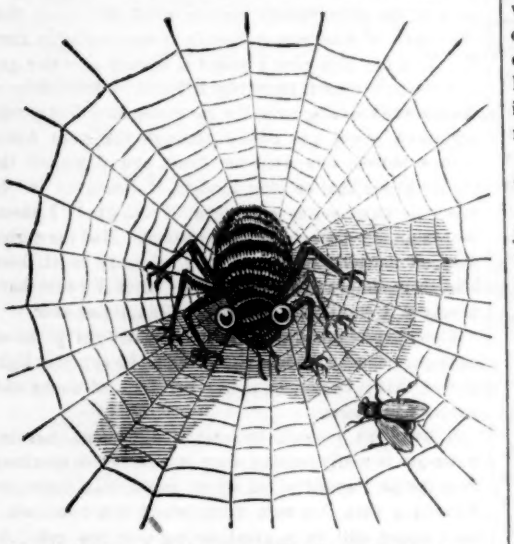
river; whole cost, say $70,000; it belongs to a Company; charge to private dwellings from $5 to $20 each; capacity of reservoir some 24,000 gallons; 10 miles of pipe, mostly iron; have no water meters. The present Company have not ascertained the income or expenses, or number of buildings supplied, to sufficient certainty to give it to you as yet. When we are in possession of such facts we will furnish you if you desire. Any other information we will furnish if you wish.

Respectfully,

JOHN C. DEACON, *President.*

BURLINGTON, N. J., March 12, 1861.

"WILL YOU WALK INTO MY PARLOR?"



To the Editor of the AMERICAN GAS LIGHT JOURNAL:

The knowing ones will relish the following official notice, issued by a VERY T'ALL Secretary of a very short (sighted) corporation in this neighborhood. It takes effect on the 1st of April. *Everybody knows whose day that is.* On the whole, the notice, as illustrated, is rather *apropos* than otherwise. A. HEM.

BROOKLYN, N. Y., March 20, 1861.

NOTICE.

The price of Gas to the private consumers of our Company, on

Fulton street, from the river to Fulton avenue;

Fulton avenue, from Fulton street to Washington avenue;

Myrtle avenue, from Fulton street to Washington avenue;

Court street;

Montague street, from Court to Clinton street;

Atlantic street, from the river to Flatbush avenue;

Columbia street, from Atlantic street to Hamilton avenue;

Will be reduced to $1 25 per 1,000 cubic feet, on the 1st of April next.

BROOKLYN, N. Y., March 13, 1861.

[This is a capital joke, no doubt; "What is it?" The illustration would pass, in the New York *Courier* office, for a *General Webb*.—ED.]

GAS-EXHAUSTERS.

LOUISVILLE (KY.) GAS-LIGHT CO., March 9, 1861.

To the Editor of the AMERICAN GAS-LIGHT JOURNAL:

I was in hopes you would have obtained the reports of the New York Gas Companies for publication, but I suppose they refuse to give them. Your last number of the JOURNAL contains the Philadelphia report, and I have concluded to place our annual report at your service, and copied it for you this afternoon in a condensed form. I have sent you also my original draft of my report to the stockholders, which saved the trouble of copying, as I have recorded it in our minute-book. Through Elliman & Bros., I have ordered two of McKenzie's Exhausters, and am preparing to build a larger engine-house and room for these machines, and a new steam-engine; the engine we now have has only power sufficient to propel our pump.

I have not fully satisfied myself as to the degree of exhaustion it will be safe to make on the hydraulic main, but I suppose a pressure of one inch of water on this main greater than the atmosphere, will be safe, as the compensator I intend making will, when this inch of water is withdrawn by a too rapid movement of the exhauster, press on a hood, to which the compensator valve is attached, with a force of 45 pounds, which will instantly allow the gas to return to the exhauster. Perhaps it would be safe to run the exhauster so that the gas in the hydraulic main was on an evuipoise with the atmosphere, as the retorts would still have 2½ inches pressure of tar to prevent the admission of air into them. I was in hopes that some of your practical men would mention, in treating of the exhauster in your JOURNAL, the common practice as to the degree of exhaustion. The English gas-books that I have seen have nothing on the subject. Indeed, I believe there is not a good work extant on the manufacture and the machinery and apparatus used in the manufacture and storage of gas. The last edition of Clegg, from the promises that preceded its publication, we had reason to expect would have given us an idea of the most improved machinery used in England. If we take this book as the criterion of the state of the art of making gas in England, we must conclude that in this country we are far in advance of them; but I do not believe that this is really the case.

Peckston's Treatise, published in 1841, contains more valuable information than the recent edition of Clegg.

The field is open for a good English work on the subject. There may be many engineers in this country qualified to write a good treatise on the subject; certainly, there are persons who could prepare a superior book to any English work now out. I know of no art in which so much capital has been invested that has had so little of a practical character respecting the machinery, its proper arrangement and management, written and delineated, as that of the manufacture of gas. That charlatan, Hughes of England, who is the leader of the gas excitement in London, wrote a book on gas-making. This book contained just enough information on the subject to show that Hughes knew nothing about the machinery he attempted to describe; yet the book met with a ready sale, each purchaser supposing he was getting a practical treatise on gas-making.

Yours, truly,

ROBT. G. COURTENAY, *President.*

CODE, HOPPER AND GRATZ'S METERS.

OFFICE OF THE NIAGARA FALLS, N. Y., GAS COMPANY, March 22, 1861.

To the Editor of the AMERICAN GAS-LIGHT JOURNAL:

In the notice of the erection of our works in your issue of the 15th of March, page 286, there was an injustice done to Messrs. Code, Hopper and Gratz, of Philadelphia, meter manufacturers, as from said article it would appear that our meters were furnished by Messrs. J. Lennig & Co., of Philadelphia, and McDonald & Co., of Albany, and the names of Messrs. Code, Hopper and Gratz not appearing; whereas, in fact, Messrs. Code, Hopper and Gratz *furnished three fourths of all our custom meters, including our station-meter.*

This error may have been my fault, or it may have been an omission of yours—which, I cannot say, as I did not keep a copy of the communication—at any rate, will you have the goodness to make this correction, as it is due to Messrs. Code, Hopper and Gratz.

Yours, truly,

T. G. HULETT, *Sup.*

[We make the above correction with great pleasure. The error, if ours, was certainly not intentional; and wherever it lies, the *amende* will carry greater weight than had no error occurred.—ED.]

REMARKABLE GAS EXPLOSION.—On Saturday, Nov. 17, 1860, an explosion of gas took place in a small house, No. 1, Elizabeth Place, Wandworth, England, which blew up the walls, and has necessitated the entire rebuilding of the house. It is stated that, through defective pipes, the gas had accumulated beneath the lowest floor in the front of the house. A woman and children were in a back room, where the floor remained uninjured, and they contrived to escape. The furniture in the house was blown to pieces. It is remarkable that a man and his wife who were in an adjoining house, and were slightly injured, did not hear any explosion, though the neighborhood were alarmed by it far and near.

COAL OIL GAS EXPLOSION.—On December 31st, an explosion took place at New Bedford, Mass., in a manufactory for refining Pennsylvania petroleum oil. The apartment became saturated with gas from the oil, mixed with air, and the touch of a match by one of the workmen caused it to explode in an instant. The force of the explosion was felt at a distance of six miles.

REPORTS OF GAS-LIGHT COMPANIES.

LOUISVILLE, KY.

OFFICE LOUISVILLE KY., GAS-COMPANY, Dec. 31st, 1860.

To the Stockholders of the Louisvil Gas-Company:

GENTLEMEN:—I have the pleasure to report the general proceedings of the Company, referring you to the Cashier's report for the details.

The General Council of Louisville, without notice to the Gas-Company, on the 12th January last, attempted to procure from the General Assembly of Kentucky, the passage of an Act amending your Charter.

Your Directory prepared a remonstrance, and directed your President to present a copy to each house of the General Assembly, and use every method in his power by employing counsel, if necessary, to cause the amendment offered by the General Council to be rejected. Upon presenting the facts to the Senate Committee, the amendment was rejected. Subsequently, on the 14th February, your Directory amended the above mentioned act, applied for by the city. Upon application to the General Assembly this act became a law. It authorizes the sale of the gas-works to the city on any terms that the stockholders and the city may agree upon. Since the passage of this amendment to your charter, the city have made no proposal to the Company to purchase the gas-works.

A circular was addressed to you on the 19th January last, stating that an extra dividend of ten per cent. had been declared payable on the 11th April, 1860. It also proposed to sell to stockholders new stock at par to the amount of $26,300, and the city of Louisville $20,000 on the same terms. At a meeting of the Board on the 26th March, it was ordered to postpone the payment of this extra dividend in consequence of the city having procured on the 22d March, an injunction from the Chancery Court, restraining the Company from selling the new stock as proposed.

On the 13th July, the Chancellor decreed that the injunction prohibiting the issue of new stock at par to the stockholders, be made perpetual, but at the same time intimated that the stock might be sold to the highest bidder. He also decreed that the Company had no right to invest $23,000 of the city's profit in bonds at par, which bonds the Company had received from the city in payment for her original stock, and the 23 bonds of $1,000 each, cancelled by the gas-company, are by the decree reinstated, and are to have the same validity as if they had not been cancelled. Your Directory were willing to settle the matter in accordance with this decree, but the decree was not approved by the city, and she has appealed to the Court of Appeals. Your Directors, with the design to stop litigation, on the 4th November, asked the General Council to appoint a committee to meet a committee of the Company, so that by conference they might endeavor to settle the controversy. A committee of four members of the Council met the committee of the Company, on the 13th November; all the facts in the case were presented to them, and on the 15th November a proposition for settlement was presented by the gas-company to the city committee. Since this time the committee on the part of the city have not been heard from, nor have they replied in any way.

The argument before the Court of Appeals, is fixed for about this time. On last Saturday, Mr. Jas. Speed made his argument; Mr. B. Ballard on the part of the city, is to be heard this day; to be followed by Judge H. Peitte for the company, Col. Caldwell for the city.

The company purchased on the 29th June, from John S. Preston and Caroline, his wife, a lot of land fronting 105 feet on the north side of Washington street, 150 feet deep to an alley, for the sum of $4,000; one-third cash, the remainder in one and two years with interest. This lot completes the site for additional works adjoining the gas-works.

The price of gas was reduced from $2.70 net to $2 50 net, on the 1st of August last.

The quantity of gas made this year is 57,559,700 cubic feet. This is 1,702,300 cubic feet more than was made last year, and rather more than double the quantity made in 1853, seven years ago.

The largest consumption of gas in one day was on the 11th December, 269,000 cubic feet.

The present year we have laid 4 miles, 5,006 feet of street mains. The whole extent of street mains is 43 miles, 4,191 feet. 1,532 applications for gas have been

made; 1,502 meters have been placed; 1,097 meters displaced; 405 new consumers have been added; the whole number of consumers of gas is 3,539; 415 new services have been laid, 21 services have been displaced; the whole number is 3,593.

146 street lamps have been placed; there are now 1,114 street lamps.

We have charged 30 worn out meters to profit and loss, $291; also 16 worn out service-pipes $160. We have also charged off to profit and loss, unpaid gas-bills $621.30, and gas-fittings bills $109.27; these bills could not be collected.

381 dry meters have been purchased at a cost of $3,764.90. We have 36 clay retorts in operation; these have not been a sufficient time in use to compare their working with iron retorts. We want in connection with the clay retorts an exhausting engine; this ought to be erected next year. The interference of the city with the sale of stock, has delayed the erection of this engine and other improvements contemplated at the gas-works.

Very respectfully,

ROBT. G. COURTENAY, *Pr.*

PRODUCT, RECEIPTS, AND EXPENDITURES IN THE MANUFACTURE OF GAS, BY THE LOUISVILLE, KY., GAS-COMPANY, FOR ONE YEAR, FROM DEC. 31ST, 1859, TO DEC. 31ST, 1860.

PRODUCT.

	Cubic feet.	Cubic feet.
Gas manufactured, by station meters	57,559,700	
Gas unaccounted for, leakage, condensation, &c., 9 48-100ths per cent		5,457,890
Gas sold by Meter		40,496,000
Consumed in street Lamps		10,948,810
do in Works, Office, and Shop		657,000
Cubic feet		57,569,700

RECEIPTS.

Gas sold by Meter and Street Lamps	128,091 41
Rents of Meters	1,201 75
Coke sold	5,027 26
Tar	276 35
	$134,596 77

EXPENDITURES.

Coal carbonized, 14,202 600 pounds	19,558 37	
do used in office and shop, 209,760 pounds	289 15	
Loss in two years in weight 1,159,100 pounds	1,453 51	
		21,328 03
Lime used in purification, 3,552 bushels		752 20
Whiskey for filling Wet meters 5,954 galls.		926 66
Wages, in making and distributing gas		19,384 06
Taxes for 1860		1,594 42
Office expenses		5,875 01
Repairs		7,629 25
Balance, net product for 1860		77,107 14
		$134,596 77

DIVISION OF GAS-WORKS.

Gas-Works proper	194,256 84	
Street Mains	180,104 69	
Services	28,040 57	
Meters	36,366 70	
Street Lamps	29,265 82	
		468,034 62
Real estate, present site of works		18,801 09
do do purchased for future extension, a near site		14,320 55
Real estate, office, shop, and pipe yard		16,544 39
Total cost		$517,700 65

STREET MAINS LAID TO 31ST DEC., 1859.

2-inch.	3-inch.	4-inch.	6-inch.	10-inch.	12-inch.
53,463 ft.	85,525 ft.	101,110 ft.	2,960	8,521	3,536

STREET MAINS LAID IN 1860.

8,198		17,928			
Total laid 61,661	85,525	119,038	2,960	8,521	3,536 ft.

Street Lamps in use 31st Dec., 1859 968
" placed in 1860 146
Total 1114 Lamps.

TOTAL COST.

Total cost of Gas-Works, exclusive of Real Estate in land, was on the 31st Dec., 1859		440,682 65
Additions in 1860, Gas-Works proper	1,193 12	
Street Mains $15,571 37	15,571 37	
Services	2,571 86	
Street Lamps	1,821 45	
Meters	6,194 17	27,351 97
		$468,034 62

PROFIT AND LOSS.

	By Balance 2d Jan., 1860		55,524 90
July 1st, 1860.	" Fee bill returned		12 15
	" Interest on Briscoe's note		7 15
	" D. Coursey's gas-bill		2 00
	" Interest on city bonds		2,510 00
	" Tar account		109 10
	" Rent account		114 00
	" Coke account		2,572 76
	" Rents of Meters		329 00
	" Gas account		49,280 16
	" Gas fittings account		1,066 76

CONTRA.

To Extra dividend, No. 2, 10 per cent	48,140 00	
To Gas-Pipe	14 75	
" Worn out Services	160 00	
" do do Meters	291 00	
" Repairs on Gas-Works	3,910 51	
" Expense account	2,954 97	
" Regular Dividend, 6 per cent., 6 months	28,884 00	
" Balance to new account	26,972 75	
	$111,327 98	$111,327 98

	By Balance 1st July, 1860		26,972 75
Jan. 1st, 1861.	" Sundry Gas-Bills		6 41
	" Interest on city bonds		2,310 00
	" Coke account		2,454 50
	" Tar account		167 25
	" Gas account		34,825 88
	" Rent account		91 25
	" Rent of Meters		872 75
	" Gas fitting account		1,226 99

CONTRA.

To Gas fitting bills $109.27, and gas-bills $621 30, worthless	730 57	
To Expense account	2,920 04	
" Repairs on Gas-Works	3,718 74	
" Regular Dividend, 6 per cent., 6 months	28,884 00	
" Balance	32,674 43	
	$68,927 78	$68,927 78
By Balance to new account		32,674 43

BALANCE SHEET OF THE LOUISVILLE GAS COMPANY, 1ST JANUARY, 1861.

Capital Stock held by city of Louisville	200,000 00	
" " held by individuals	281,400 00	
		481,400 00
Contingent fund, to replace worn out machinery		70,000 00
Profit and Loss account (including Jan. dividend)		61,558 43
Unpaid dividend, No. 41 $12, No. 42 $72	84 00	
Extra dividend No. 2, suspended by a suit of city of Louisville, now in Court of Appeals	48,140 00	
		48,224 00
Lamplighters account		110 00
Bills payable		2,666 66
City of Louisville interest and dividend account		10,408 40

CONTRA.

Bonds of the city of Louisville paid for capital stock	77,000 00	
Stock in Louisville and Frankfort Railroad	3,762 50	
do do and Nashville do	1,165 59	
Cash on hand	32,607 52	
Cast iron lamp account	113 63	
Louisville Gas-Works and real estate	517,700 65	
Gas-Fittings on hand	3,006 58	
Retorts on hand	1,426 46	
Coal on hand	3,657 00	
Lime on hand	333 26	
Whiskey and alcohol on hand	85 70	
Unpaid gas-fitting bills	437 35	
Unpaid gas-bills due from individuals	13,556 58	
Unpaid gas-bills due from city of Louisville	16,711 07	30,267 65
Unpaid coke bills		493 60
City of Louisville interest on bonds		2,310 00
	$674,367 49	$674,367 49

BROOKLYN, N. Y.

The following report of the Brooklyn (N. Y.) Gas-Light Company to the Legislature of their State, is in conformity to a resolution of the Assembly calling for it. It would be much more graceful and proper for all the Gas-light Companies to present reports semi-annually, at a meeting of stockholders called for the purpose, as is the custom in England, than be compelled to make them, and then produce such unsatisfactory Laconism as the following.

St. Louis, Mo., Philadelphia, Pa., and Louisville, Ky., have set a good example to the other Gas Companies of the United States, and we know it is the opinion of still other principal Companies that it should be done generally, but the Genius of Silence has so long had possession of them that they dare not break the charm. It is only a question of time.

STATE OF NEW YORK.—NO. 81.

IN ASSEMBLY, FEBRUARY 25, 1861.

Report of the Brooklyn Gas-Light Company.

THE BROOKLYN GAS-LIGHT COMPANY,
BROOKLYN, N. Y., February 23, 1861.

H. A. RISLEY, Esq.:

DEAR SIR:—In answer to yours of January 25th, 1861, with resolution of Assembly of State of New York, calling for a report from this Company, I enclose the same to you. Yours, respectfully,

V. T. HALL, *Secretary.*

Report of the Brooklyn Gas-Light Company, made pursuant to a resolution of the State Assembly, dated Albany, January 25, 1861.

Amount of receipts from all sources during the year 1858		$500,376 65
Amount of expenditures and disbursements during the year 1858	392,024 72	
Dividends in 1858	113,000 00	
		$505,024 72
Amount of receipts from all sources during the year 1859		$574,649 88
Amount of expenditures and disbursements during the year 1859	357,043 88	
Dividends in 1859	113,000 00	
		$470,043 88
Amount of receipts from all sources during the year 1860		$635,372 56
Amount of expenditures and disbursements during the year 1860	554,722 27	
Dividends in 1860	113,000 00	
		$667,722 27

The extent of the ground occupied by the company is about one hundred and twenty lots, 25 × 100 feet each. On which are the buildings necessary for the manufacturing and distribution of gas to the city, and offices for transacting the business connected therewith.

The estimated value of the whole property, as charged to capital stock January 1, 1861, is $1,116,073 46.

The remaining assets of the Company consist of the balances due from various accounts, as on their books:

January 1, 1861	187,395 95
Cash then on hand	13,481 33
Their liabilities: Balances due from the Company, on various accounts, January 1, 1861	$36,085 98

R. NICHOLS,
President Brooklyn Gas-Light Com.

V. T. HALL, *Secretary.*

Sworn before me, this 23d day of February, 1861.
KEN'D BURTON, *Com'r of Deeds.*

THE MAUVE COLORS.—We have ere now spoken of the wonderful variety of products from coal and coal-tar; but it is well to be reminded of the source of some of the beautiful new colors, as in the *Dilettante Review*, which thus speaks of them:—The great interest that attaches to these colors does not consist in their novelty only, but in the fact of their being produced from *coal*, and in their importance, technically speaking, as permanent and beautiful dyes. The production of the mauve dye reposes upon that of a very remarkable substance called aniline, which is found in gas-tar, but only in minute quantities. A host of curious compounds have been found in gas-tar, and among them aniline, which, in a pure state, appears as an oily, transparent liquid, possessing properties such as characterize those substances called "alkaloids," such as quinine, strychnine, nicotine, &c. It would probably form a medicine similar in its effects to sulphate of quinine; but at present science has only called upon it to yield dyes of a beauty never witnessed before its discovery. The great merit of the mauve dye is the beauty and permanency of the tints which it imparts. Its power of coloration is so great that a small quantity of it gives coloring to a large number of vats. While coal would hardly sell at one farthing per pound, a similar weight of aniline dye is said to be worth from sixty to eighty pounds sterling!—*London Builder.*

TEST FOR SULPHURET OF CARBON IN COAL-GAS.—In the *Chem. Centralblatt*, a new test for sulphuret of carbon is described by Dr. C. Herzog, as follows:—Prepare a saturated solution of ammonia in absolute alcohol, and a perfectly saturated solution of sugar of lead. Place in a test tube five drops of the lead solution and about a drachm of the alcoholic ammonia, and allow the glass to bubble through the solution from a narrow glass tube just dipping under the surface. If sulphide of carbon be present in the gas, the solution immediately takes an orange color. For a controlling experiment, the gas may be passed for a short time through the alcoholic ammonia alone, and a couple of drops of the lead solution added afterwards, whereupon, if sulphide of carbon be present, the orange precipitate is produced as before. To free the gas from sulphuretted hydrogen, it may be first passed through a lead solution, which does not affect the sulphide of carbon. It is remarked that the orange precipitate obtained as above, if allowed to remain in the liquid, turns white in twenty-four hours; but if collected on a filter at once, slightly washed and dried, it remains of a dark brown color. The chemical changes which take place when the sulphide of carbon is passed into the alcoholic ammonia, are, according to the author, somewhat complex and variable, but the test is very simple, and, at the same time, practical.

A BEAUTIFUL EXPERIMENT WITH THE ELECTRIC LIGHT.—On the 2d of September, a first experiment was made of illuminating the famous Falls of Shaffhausen on the Rhine, thirty yards in height, by means of five electric lights. The effect is said to have been marvellous; especially when viewed through colored glasses, the waves of the river resembling a sea of fire. The experiment was instituted at the request of the Directors of the Swiss Railroad Company, who propose during the coming year to organize a series of night-fêtes, of which this illumination will be the greatest attraction.

PATENTS.

Inventors are informed that Patents are procured at the Rooms of the AMERICAN GAS-LIGHT JOURNAL, through F. C. TREADWELL, Jr., Esq., an experienced Patent Agent and Expert, in the United States, and in all other countries where Patent Laws are in force.

UNITED STATES.

461. J. G. Leffingwell, of Newark, N. J., for an Improvement in Gas Cocks:

I claim the combination of set screw or screws and lever, with a gas cock, constructed substantially in the manner and for the purpose specified.

462. R. R. Lewis, of New York City, for an Improvement in Vapor Burners for Heating, &c.:

I claim the burner composed of the inner and outer perforated tubes, A B the disks, a a, and the granulated mineral filling in the annular space between said tubes, the whole combined substantially as and for the purpose specified.

468. Charles Monson and Stillman Moore, of New Haven, Conn., for an Improvement in Gas Burners:

We claim the use of the double tubes, A and B, so as to be readily adjusted in their rotary without changing their longitudinal position, when constructed, arranged and fitted as and for the purpose substantially as described.

492. W. H. Topham, of New Bedford, Mass., for an Improvement in Lamps:

I claim the arragement of the flanched screw socket, H, and disk, c, with the band b, tubes, D E F, and cap, I, in the manner and for the purpose shown and described

The employment or use of the double armed spring, K, in combination with the cap, I, and spring, L, in the particular manner shown and described, for the purposes set forth.

I claim the arrangement of the rings or plates, G, to extend from the plate, c, to the inner surface of the cone or deflector, J, so as to inclose the flame, all in the manner and for the purposes shown and described.

[The object of this invention is to supply the flame with a requisite amount of oxygen to support proper combustion and to present the air to the flame in a warm state, so that the flame will not be cooled thereby.]

499. Frederick Willford, of Eagle, Wis., for an Improved Apparatus for Walling Wells, Cisterns, &c., with Grout:

I claim, first, A hollow cylinder, to be constructed in two main parts and hinged together, in combination with the moveable or swinging stave and the stretchers or extension braces, to be constructed and operated substantially as described and set forth; and—

Second, The movable or swinging stave in combination with the stretchers or extension braces and connecting rod; the whole to be constructed and operated substantially as described and set forth.

502. A. H. Wood, of Boston, Mass., for an Improvement in Gas Burner Regulators:

I claim a regulator for gas fixtures, gas burners, &c., constructed and arranged substantially as described, so as to constitute not only a throttle valve, but also a receptacle or basin susceptible of removal for cleansing, for receiving the condensed matters or tarry products evolved from the gas.

507. C. W. Cahoon (assignor to J. B. Cahoon), of Portland, Maine, for an Improvement in Lamps:

I claim the combination of chimney fastenings with a thumb lever, substantially as described, so that the chimney may be withdrawn by pressure upon the lever.

I also claim the combination of a guard with the thumb lever, the said guard being located between the chimney and that end of the lever to which pressure is applied, substantially as described.

I also claim the combination of a spring with a thumb lever fitted with the chimney fastenings, substantially as described.

I also claim the combination of a chimney guard with a thumb lever, substantially as described.

I also claim the combination of an opaque lamp body, with a transparent plate, substantially as described.

593. D D. Hardy and J. J. Morris, of Cincinnati, Ohio, for an Improvement in Rotary Pumps:

We claim the employment of the rotary pistons, B B', formed of two semi-cylinders of different diameters, in combination with the two central inner tongues or projections, D D', of the case A, substantially as shown and described.

[This invention consists in the employment of two rotary pistons, each formed of two semi-cylinders of different diameters, in combination with two central inner tongues or projections within the shell or case; the whole being constructed and operated in such a way as to overcome the difficulties attending the operation of rotary pumps, both as regards durability and the amount of work performed in a given time, as well as the power required to operate them.]

610. T. J. Mayall, of Roxbury, Mass., for an Improvement in Waterproof Hose:

I claim forming a hose or tubing in two flat pieces or sides of cloth or woven fabric, coated with rubber or gutta-percha, in one or more layers or thicknesses, and united at their edges by sewing, riveting, or otherwise, substantially as set forth.

614. J. M. Perkins, of Cleveland, Ohio, for an Improvement in Water Elevators:

I claim the buckets, E E, attached to the windlass, B, as shown and provided with the recesses, d, in connection with the spout, F, provided with the curved rods or hooks, G, arranged in such relation with the buckets to operate as and for the purposes set forth.

[This invention has for its object the drawing of water for domestic purposes by a very simple arrangement of means, which may be operated with the greatest facility, be cheaply constructed and applied, and not liable to get out of repair or become inoperative by use. The invention consists in the use of two buckets, connected by ropes or chains to a windlass, in such a way that one bucket will rise as the other falls, and using in connection with the buckets thus arranged, a spout or discharge trough provided with curved rods, to serve as stops, and placed in such relation with the buckets as to tilt the same as they reach their culminating point, and discharge their contents into the discharge spout.]

548. T. J. Mayall, of Roxbury, Mass., for Improvement in Caoutchouc Hose Tubing:

I claim a hose or tubing in which the periphery of one or more of its layers is formed by winding upon an inner tube or lining strands of thread, twine, wire, &c., substantially as set forth.

563. H. W. Spooner, of Erie, Pa., for an Improvement in the Tubes of Artesian Wells:

I claim, in the use of tubes or cases for oil, well or other borings, the arrangement of the means recited, substantially as and for the purpose set forth.

41. W. T. Vose, of Newtonville, Mass., for an Improvement in Portable Pumps. Patented Nov. 14, 1859.

I claim the combination of a footstand, stirrup or rest, as set forth, with pump barrel, in manner substantially as described.

Things Ancient, Quaint and Rare.

GLEANINGS ABOUT BREWERS.

FROM OLD NEWSPAPERS.

We hear that Mr. Rush and Mr. Maggot, the brewer, ſtand candidates for the Borough of Southwark at the enſuing election, and that next week they are to give an extraordinary entertainment on that occaſion.—Feb., 1722.

The Lord Mayor has nominated Thomas Taſh, Eſq., brewer, as a proper perſon to ſerve the office of Sheriff of this City.—April, 1763.

In 1766 the conſumption of malt in England, by brewers, innholders, and publicans (exclusive of private families) was computed to amount to upwards of 3,125,000 quarters annually.

In 1835 there were in England 1,907 brewers, 53,207 publicans, 35,354 perſons licenſed to ſell beer, 25,483 publicans who brewed their own beer, and 14,698 perſons licenſed to ſell who alſo brewed their own beer. In 1834 the brewers uſed 15,837,409 buſhels of malt; the brewing publicans uſed 9,373,206; the licensed beer ſellers uſed 3,734,288. In Scotland there were only 217 brewers, who conſumed in 1834, 997,771 buſhels of malt; the licenſed victuallers there (of whom there were 17,239) uſed 141,830 buſhels. Ireland had 240 brewers, whoſe conſumption of malt was 2,055,326 buſhels. Total for 1834, taking the whole United Kingdom into the account, 2,364 brewers, 70,466 publicans, and 35,354 perſons licenſed for the general ſale of beer; who altogether uſed 32,139,650 buſhels of malt. In that year 71,418 barrels of beer were exported, on which a drawback of £17,854 10s. was allowed.

We hear that porter will be raiſed to threepence half-penny a quart, and on this account, for the convenience of change, twenty tons of farthings are ordered to be coined at the Mint, the whole of which it is ſaid are to be delivered to an eminent porter brewer. They are coined from a dye of his late Majesty of the year 1754.—Feb. 1762.

WATER-GAS WORKS.

WATER-GAS.—APPLETON & GRAHAM,

AGENTS FOR THE

NEW ENGLAND WATER-GAS COMPANY,

UNDER THE SANDERS PATENT,

Are prepared to give estimates for Works, and guarantee the cost of Gas not to exceed One Dollar per 1000 cubic feet.

☞ Coal or Rosin Gas-Works altered at small expense.

A. & G. continue as heretofore to erect their improved Rosin and Rosin-Oil Works for Private Dwellings, Factories, &c. For further particulars apply at 56 WASHINGTON-ST., BOSTON.

SITUATIONS WANTED.

WANTED.—A Situation by a person who has served five and a half years at gas fitting; has superintended gas works for three years, having had control of two at one time. Can set Lamp Posts, Meters, Retorts, lay Mains, or do any other necessary work about a Gas-Works. Address

C. S., Box No. 223,
Lewisburg, Union Co., Pa.

A Practical Gas Fitter and Gas-Engineer desires a situation in a Northern gas-works. A stoker at present engaged with him would like to accompany him. The highest references will be given on addressing

P. F. T.,
Rooms of the AMERICAN GAS-LIGHT JOURNAL.

A Gas-Engineer at present engaged in a Western gas-works, desires a situation from the first of April, when his present arrangement will expire. Address, K. J. care of the Editor of the AMERICAN GAS-LIGHT JOURNAL, through whom his present office was obtained.

ANTI FREEZING APPARATUS

FREEZING OF GAS-PIPES.— Walton's Patent Anti-Freezing Apparatus illustrated by engravings, in the AMERICAN GAS-LIGHT JOURNAL, of Jan. 1, 1861, page 212, is the most simple, durable and efficient of any known process.

See also certificates from Cincinnati, O., and Louisville, Ky. Gas-Works in same number, page 208. Address, JOHN WALTON,
Supt. Gas-Works, Louisville, Ky.

SCIENTIFIC BOOKS.

GAS ENGINEERS' LIBRARY— A few works, indispensable to Engineers, Contractors and others engaged in the construction of Gas Works and manufacture of Gas, have been selected out of a large stock of chemical and other works, and are recommended to the attention of those interested. See page 208, vol. 11, of this JOURNAL.

For sale at the Rooms of the AMERICAN GAS LIGHT JOURNAL, New-York.

COAL OIL.—A Practical treatise on Coal, Petroleum, and other distilled Oils, by Abraham Gesner. 8vo., illustrated. Cloth, $1 50.

Sent free by mail on receipt of the amount.

BAILLIERE BROTHERS, 440 Broadway, N. Y.

BAILLIERRE BROTHERS keep always on hand a complete assortment of all new books on Chemistry and the Sciences.

Catalogues sent gratis on application.

GAS LANTERNS.

A. & G. BRANDON, Manufacturers of Street and Fancy

LAMPS,

of every pattern, for Hotels, Saloons and Public Buildings, on hand and made order.

Cities, Villages, and Gas Companies supplied with Street Lamps, on favorable terms. Office, No. 4 TYRON ROW, City Hall Square, and Manufactory, No. 102 Mulberry street, one door from Canal street, New-York.

Cast Iron Street Lanterns, neat and very durable.

For sale by JOHN JEFFREY, Cincinnati, Ohio

Street Lanterns cast in three pieces, which are fitted together without bolts, rivets, solder or other fastenings; glazed without tins, putty, or catches; the glass slipping into grooves cast in the lantern. These lanterns have been adopted, and are now used, by the City Councils of Cincinnati, O., Covington, Ky., and other cities.

GAS-METER FLUID.

FLUID for GAS METERS.—The undersigned is prepared to furnish the Glycerine meter fluid in quantities to suit purchasers: *it does not evaporate, can be made to stand any degree of cold liable to occur in this country or in Canada, and does not corrode the metals of the meter. It has been in use successfully for the last three years.*

For particulars, references, &c., address the manufacturer. HENRY BOWER,
Box 363, Philadelphia, Pa.

LIGHT-HOUSE BOARD.

OFFICIAL.—NOTICE TO MARINERS.—No. 104. Africa—Southeast Coast—Fixed White Light at mouth of Buffalo River.

TREASURY DEPARTMENT, Office of Light-House Board, Washington, Dec. 20, 1860.

Official information has been received at this Office that the Colonial Government at the Cape of Good Hope has given notice, that on and after the 25th day of August, 1860, a light would be exhibited from the light house recently erected at the entrance of Buffalo River, East London, Southeast coast of Southern Africa.

The light is a *fixed white* light, elevated 45 feet above the level of high water, and visible in clear weather from a distance of about 11 miles.

The light house—painted in alternate bands of red and white—stands on the reef at the south side of the entrance of the river.

R. SEMMES, Secretary.

PATENT RIGHTS.

INVENTORS' DEPOT & SALES Room for Patent Rights.—Parties desirous of placing with us valuable Patents, for the sale of Rights, on commission, will here find the Head-Quarters for Inventors and their Patents, as well as for parties seeking investments in articles of undoubted merit. The public are invited to call, or send for Circulars. New articles coming in daily. BUTLER, HOSFORD & CO.,
No. 30 Broadway, N. Y., Proprietors of the Paragon Self-Generating Gas-Light.

MISCELLANEOUS.

WOODEN TRAYS FOR GAS-PURIFIERS.—JOHN L. CHEESMAN, No. 147 Avenue C, near Tenth street, New-York, manufactures his Patent WOODEN TRAYS for GAS PURIFIERS, *cut out of the solid wood*, superior to the ordinary iron plates, cheaper and more durable. The attention of Gas Companies and Engineers is called to this improvement, which has been adopted by the following Gas Works:

Albany, N. Y.,	Manhattan, N. Y. City,
Chicago, Ill.,	Philadelphia, Penn.,
Williamsb'gh, N.Y.,	Worcester, Mass.

See Engravings on page 148, Vol. II.

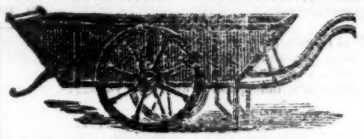
HARRIS LOUDERBACK,
FIRE-BRICK LAYER
AND GAS RETORT SETTER,
No. 1005 Clement St., Philadelphia.

MISCELLANEOUS.

McKINNY & KELLY,

MANUFACTURERS OF

COAL-SCOOPS & COKE-BARROWS



FURMAN-St., Near Fulton Ferry, Brooklyn, N. Y.

GAS THERMOMETERS FOR ascertaining and regulating the temperature of the gas while passing through the purifiers into the station meters. For sale at the Rooms of the AMERICAN GAS LIGHT JOURNAL.

A LAMP CHIMNEY that will not break! This invention possesses many advantages over the glass chimneys now used on Coal Oil Lamps. They do not break from the heat, falling, cleaning, or any ordinary usage.

THEY FIT ALL THE BURNERS NOW IN USE.

For particulars call or address the Patentees and Manufacturers,

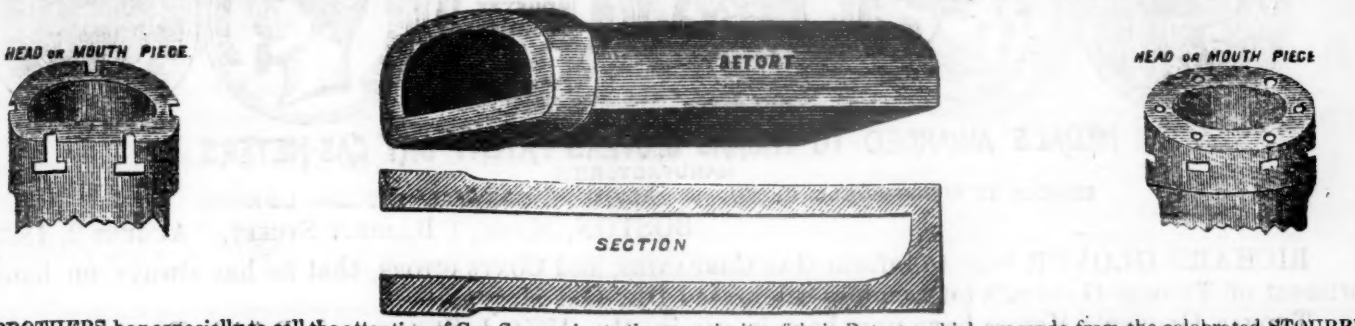
HORNING & HUMPHREY,
No. 321 N. Second St.
Philadelphia.

BURTIS' PATENT COMPENSATING COUNTERBALANCE FOR GASOMETERS.—This Improvement consists in making the attachment to the Gas-Holder by counterweights in such a manner as to effectually prevent it from getting out of level so as to bind, and also to prevent any escape of Gas at Cup or Hydraulic seal, where the Holder is on the Telescopic plan. Holders that work out of level, are thus evenly balanced, and prevented from binding or lodging against Tank-wall and falling down, thereby being rendered unfit for service. Where Holders or sections of Holders cannot be used on account of the above difficulties, this arrangement will remove them, and place the Holder in good working order; moreover, with this attachment, deep tanks are not necessary.

BURTIS' COUNTERBALANCE has been in use for three years at the Gas-Works, Chicago, Ill. Its resistance to high winds and snow-drifts, is alone sufficient to recommend its general adoption. For Engravings, see AMERICAN GAS-LIGHT JOURNAL for June, 1860, page 221. Address P. T. BURTIS,
Engineer Gas-Works, Chicago, Ill.

KING BROTHERS,

STOURBRIDGE, ENGLAND, FIRE-BRICK AND RETORT WORKS.



KING BROTHERS beg especially to call the attention of Gas Companies to the superiority of their Retorts, which are made from the celebrated STOURBRIDGE FIRE-CLAY. Mr. King has patented a Kiln for Burning Retorts, by which Patent all Cold Air is excluded from the Kiln while burning thus rendering them

FREE FROM CRACKS AND CORRECT IN FORM.

By great care in Manufacturing, combined with the advantages in burning, a VERY SMOOTH SURFACE is obtained, rendering them less liable to carbonize

RETORT OVENS, FIRE-BRICKS, GUARDS, SADDLES, RABBITTED BURS, FLUES, AND QUARRIES, ARE ALL MANUFACTURED OF THE SAME QUALITY OF CLAY.

EVERY RETORT AND BRICK IS BRANDED "KING BROTHERS, STOURBRIDGE."

HARRIS & PEARSON,

(PROPRIETORS OF

BEST GLASS-HOUSE POT, AND CRUCIBLE CLAY.

Manufacturers of Fire-Bricks, Gas-Retorts, and Glass-House Furnace-Bricks of every description.

AMBLECOTE FIRE-CLAY AND BRICK WORKS, STOURBRIDGE, ENGLAND.

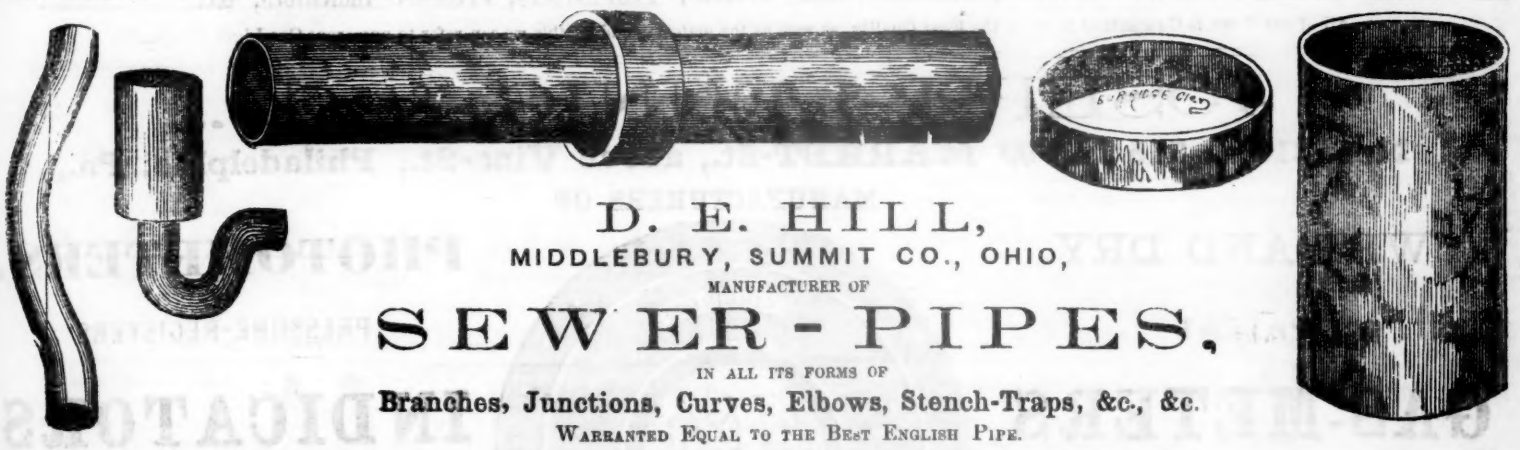
CODE, HOPPER & GRATZ,

1500, 1502 and 1504 FILBERT-St., PHILADELPHIA.

MANUFACTURERS OF

Pressure Registers, Pressure Indicators, Pressure Gauges, Photometers, Governors, Station Meters, Customer Meters, (Wet and Dry,) Experimental Meters, (Wet and Dry,) Show Meters, (Wet and Dry,) Meter Provers, Centre Seals, &c.

The high reputation which we have enjoyed for more than twenty-two years, and the fact that we have manufactured a greater number of Gas-Meters than all other manufacturers in this country combined must present itself as a security to parties desirous of securing the most reliable instruments. Having completed a most extensive addition to our Factory, and added many important improvements to our machinery, we are enabled to fill orders entrusted to us with dispatch, and in all cases *Guarantee Entire satisfaction.* Our Patent Rotary-Valve Dry Gas-Meter is now used by upwards of Two Hundred Gas Companies, giving general satisfaction; we therefore recommend it, believing it superior to any other Dry Gas-Meter manufactured. All Meters tested separately by a sworn Meter-Inspector, and sealed when desired.



D. E. HILL,

MIDDLEBURY, SUMMIT CO., OHIO,

MANUFACTURER OF

SEWER-PIPES,

IN ALL ITS FORMS OF

Branches, Junctions, Curves, Elbows, Stench-Traps, &c., &c.

WARRANTED EQUAL TO THE BEST ENGLISH PIPE.

EDWARD COCKEY & SONS'

PATENT GAS-VALVES.

These Valves are formed of two Cast-Iron Cylinders, with segmental divisions, having the faces ground gas-tight—the upper Cylinder turning horizontally on the lower one. The lower Cylinder has pipes from each division, communicating with the vessels to and from which the gas is to be passed. The upper Cylinder has corresponding divisions, so arranged as to direct the passage of gas to the different segmental divisions in the lower part, and when it is turned on the face of the lower one, to alter the flow of gas from one vessel to another.

Each valve has an index-plate provided, which is to be attached to the floor, and a pointer on the cover of the Valve shows which way it is turned. Thus, the Manager of the Works can at once see in which direction the gas is passing.

There are about fifty of these Valves now in use, of sizes varying from two to twelve inches, and they are giving great satisfaction. Amongst the Works at which they are fixed, the following may be mentioned:—

BASINGSTOKE.	CANTERBURY.	FROME.	RYDE.
BLANDFORD.	ENNISCORTHY.	GODALMING.	SANDWICH.
CHELTENHAM.	ELGIN.	NEWPORT.	WARMINSTER.

They are in course of erection at other important Works.

IRON WORKS, FROME SELWOOD, ENGLAND.

EDWARD COCKEY & SONS,

ALSO MANUFACTURE

Purifiers, Scrubbers, Condensers, and other Improved Gas-Apparatus,

HAVING PATTERNS SUITABLE FOR GAS-WORKS OF DIFFERENT SIZES.

MEDALS AWARDED TO THOMAS GLOVER'S PATENT DRY GAS-METERS.

MANUFACTORIES

SUFFOLK ST. CLERKENWELL GREEN. & ALLEN ST. GOSWELL ST. LONDON.

BOSTON, Mass., 1 Barrett Street,—August 2, 1860.

RICHARD GLOVER begs to inform Gas Companies, and Contractors, that he has always on hand a large assortment of Thomas Glover's (of London) celebrated Dry Gas Meters.

Thomas Glover's Meters have now been in use in the United States and British Provinces, for the last Fourteen Years, and are extensively used by many Gas Companies, to their entire satisfaction; and R. Glover can with all confidence, refer to them in proof that Thomas Glover's Meters are—the most Perfect in Principle—the most Correct in Registration—and more Durable than any other Dry Gas Meter made in the United States or Great Britain. R. Glover will at all times be glad to repair any Gas Meters sent him at the above factory. If any of them are of Thomas Glover's manufacture, and of a more recent date than Three years, he will make no charge.

DOWN & MERRIFIELD,

Nos. 340, 342, 344 and 346 West Twenty-second Street, North River, NEW YORK CITY,

MANUFACTURERS OF

WET AND DRY PATENT GAS-METERS,

Pressure-Registers, Pressure-Indicators and Gauges, Station, Show, Customer, and Experimental Gas-Meters, Centre or Hydraulic Valves, Governors, Compensators for Exhausters, and the Standard Testing Gas-Holders* for Proving Meters, now used in the State of New York in compliance with an Act of the Legislature. Also, Bunsen's Photometer, with complete Apparatus for working the same.

*The standard of measurement of this Gas-Holder is given by Professors Torrey, of the U. S. Assay Office; Joy, of Columbia College; Gibbs, of the Free Academy and several other distinguished scientific gentlemen.

JOHN J. GRIFFIN & CO.,

No. 7 BEEKMAN Street, and 76 West 37th Street,

NEW YORK CITY,

MANUFACTURERS OF WET AND DRY GAS-METERS,

Station-Meters, Proving-Machines, Show-Meters, Test-Meters, Pressure Indicators, &c.

All of our Work is Guaranteed to be of the First Quality, as well as the material, and for this we can refer to numerous Gas-Light Companies.

JOSEPH LENNIG & CO.,

Nos. 313 & 315 NEW MARKET-St., above Vine-St., Philadelphia, Pa.,

MANUFACTURERS OF

WET AND DRY PATENT **GAS-METERS,** STATION, SHOW, CUSTOMER, AND EXPERIMENTAL **METERS,**

PHOTOMETERS, PRESSURE-REGISTERS **INDICATORS,** AND GAUGES, GOVERNORS, METER-PROVERS CENTRE-SEALS, FLUID GUAGES, &c.

The flattering Testimonials we are receiving from Gas Officers, accompanied with expressions of such general satisfaction, and the fact of a tried experience for fourteen years, must present itself as a security to parties desirous of securing the most reliable Instruments. We therefore recommend our Patent Dry Gas-Meter, believing it superior to any Meter manufactured. Messrs. J. Lennig & Co. confine their sole attention to the business of Gas-Meter making.

Our materials are the best in use; the strictest attention is given to workmanship, and we guarantee entire satisfaction to all purchasers.

Purchasers may at any time inspect our Works, and the materials of which our Meters are manufactured. We are fully prepared to execute all orders, upon the shortest notice, and it will be to the interest of parties to call upon us. ☞ Each Meter Tested Separately by a Sworn Inspector, and Sealed when desired. ☜

METERS REPAIRED AND FORWARDED WITH DISPATCH.

GAS, STEAM, SMOKE,

PURE WATER & SOIL PIPE

FROM

JOSEPH CLIFF,

Wortley Fire-Brick Works, Leeds, Eng.

T. W. PARMELE, Agt.,

No. 4 Irving Place, N. Y.

STOURBRIDGE FIRE-CLAY WORKS.

E. BAKER & CO.,

SUPPLIERS OF

STOURBRIDGE FIRE-CLAY GOODS, &c.,

TO ALL HER BRITANNIC MAJESTY'S DOCKYARDS, &c.,

24 Wharf, Harrow Road, Paddington.

Mines and Manufactory—BRIERLEY HILL, STAFFORDSHIRE.

Fire-Clay Retorts, Glass-House Tiles, Cupola Bricks, Lumps, Cement, Crucible and best Pot Clays, &c., &c.

☞ Shippers supplied on liberal terms.

JOHN RUSSELL & CO.,

PATENT TUBE MAKERS,

THE OLD TUBE WORKS, WEDNESBURY, AND THE ALMA WORKS, WALSAL, STAFFORDSHIRE

69 UPPER THAMES-ST., & 5 CHARLES-ST., SOHO, LONDON;

AND 35 GRANBY-ROW, MANCHESTER, ENGLAND.

The original Manufacturers of WROUGHT-IRON GAS TUBES, and the Inventors of the Lapwelded Tubes for Locomotive and Marine Boilers. All kinds of TUBES and FITTINGS, whether for Gas, Steam, or Water. Galvanized and Composition Tubes. Chandeliers, and every kind of Brass-work or Gas and Steam.

STOCKS, DIES, AND TAPS OF ALL SIZES. CAST IRON PIPE AND GAS-METERS.

ALL GOODS WARRANTED.

GENGEMBRE'S PATENT
NON-FREEZING AND NON-EVAPORATING
GAS-METER FLUID.

By the use of this Fluid, the WET GAS-METER of ordinary construction is rendered the most perfect and most reliable Gas-Measuring Instrument ever offered to Gas Companies. In winter the Meter will continue to work equally well, *however exposed it may be*; and in summer, the level of the Fluid remaining constant without refilling, the measurement of the Gas will be both uniform and constant.

The use of this Fluid is both easy and economical, and Gas Companies desirous of using it, will be licensed on liberal terms. For further particulars, and certificates of parties having used the same or over three years, and for city rights, apply to

A. DOISY, Box 1180,

General Agent and Attorney for GENGEMBRE'S PATENT.

N. B.—No Sales of Territorial right, or Licenses for using my Patent will be valid, without being ratified by my Signature, as I have no Agent authorized to execute the same.

H. P. GENGEMBRE, PATENTEE, Box 48, Alleghany City, Penn.

THE

STERLING GAS-REGULATOR

Improves the Light, and Saves a Large per centage of Gas.

MANUFACTURED BY THE

WHEELER & WILSON SEWING-MACHINE COMPANY.

It is well known that Printers require the best and most brilliant light. In proof of the superiority of these Machines over all others, the following New York establishments are using them, and testify to their excellence:—New-York Times, New-York Herald, New-York World, New-York Tribune, New-York Sun, Journal of Commerce, Courier & Enquirer, Evening Post, The Zeitung, Dispatch, Leader, Scientific American, Advertiser and Spectator, Independent, Daily News, Harper's Monthly and Weekly, Transcript, Mercury, Atlas, Life Illustrated, Albion, Spirit of the Times, AMERICAN GAS-LIGHT JOURNAL, Christian Enquirer, Churchman, Church Journal, Christian Advocate, Christian Ambassador, Christian Intelligencer, Observer, Sunday Times, Sunday Courier.

By order of the New York and Brooklyn Common Councils, these Regulators are now used in the City Halls, Police Stations, Markets, and other Public Buildings in both cities.

They are Warranted by the

WHEELER & WILSON SEWING-MACHINE CO.,

505 BROADWAY, NEW-YORK

To keep in order, and always maintain the pressure of the Gas at the lowest point for a brilliant light, and economical combustion. They are so constructed that *under no circumstances can the Mercury get into the Meter, or in any way injure them.*

WARREN'S PATENT WATER AND ALARM GAUGE.

For Protecting the Flues and Preventing Steam-Boiler Explosions.

This is a reliable High and Low Water Detector, arranged so as to render it one of the best Water Gauges ever attached to a Steam-Boiler; always presenting before the Engineer at sight, the exact height of the water, and if, by oversight or by sudden leakage, the water gets low in the boiler, it will cause an alarm before the water gets below the flues, thereby preventing an explosion. This Gauge can be made to alarm at any point desired as a High Water Detector, thereby preventing the water from getting to that height as to be forced into the cylinder of the engine, often causing serious accidents. Thus it is a High as well as a Low Water Detector. For sale by

WARREN & BANKS,

153 Centre St., Corner of Canal St., New York,

Where a gauge is constantly in operation.

F. BUTTS & CO.,

(Successors to BUTTS & KENDALL,)

DEALERS IN THE CELEBRATED

STERLING COAL,

PITTSBURGH AND OTHER GAS-COALS,

Cleveland, Ohio.

We beg to call the attention of Gas-Light Companies to the following; from which, (and others,) and the universal expression of Gas Men, as to the superior quality of

STERLING COAL,

we believe that it is the BEST COAL IN THE COUNTRY.

From the Manhattan Gas-Light Co., New York.

Gentlemen—Yours of the 9th inst. is received. The "Sterling Coal" received from you during the past year worked very satisfactorily—averaging 9520 cubic feet of 15 candle Gas per ton of 2240 lbs., and 41 bushels of Coke weighing 1465 lbs.

We consider it among the best of American Gas Coals, for the quantity and quality of the Gas produced, and also for the excellent quality of its Coke.

I am, Gentlemen, Your Obedient Servant,

CHARLES ROOME, *President.*

From the Rondout and Kingston, N. Y., Gas-Light Company.

Gentlemen—The 600 tons of Coal ordered from you in August, 1859, has now been in use over four months, to my entire satisfaction.

Its average yield is 4 40-100 feet, and a good strong light. The Coke produced equal, both in quality and quantity, to best English Coking Coals. It burns very freely, with little clinker. In purification it is economical, using no more lime than New Pelton. It is superior to any American Coal I ever used. I shall be pleased to give you any further information at my office in New York.

WM. W. HAGUE, 552 Broadway.

From the Sandusky, O., Gas Co.

Gentlemen—This Company has used your Sterling Coal since July 3d, 1856, and are still continuing the use of it with satisfaction to the Company and consumers. The average product has been 8,620 feet of Gas per ton of 2,000 lbs., and 37 bushels of Coke of very superior quality. The Gas is as good as that obtained from Pittsburgh Coal. I consider it the best Coal ever used in our works.

I am, Gentlemen, Yours Respectfully,

WILLIAM HUDSON, Sup't and Sec'y.

From the Toledo, O., Gas-Light Co.

Gents:—Your favor of the 15th inst. to hand and noted.

The Sterling Coal received from Messrs. Butts & Co., the last Summer and Fall, fully sustains the character it has as a Gas Coal, from previous use in our works. We think the quality of Gas is very good, a little better than that produced from the Coal had of them the year previous—yielding 8,666 feet per ton of 2,000 lbs., and 36 bushels of Coke, of very good quality, well adapted to our use.

Respectfully Yours,

GEO. SPENCER, President.

From the Buffalo, N. Y., Gas-Light Co.

MESSRS. F. BUTTS, & Co.—The Sterling Coal we have had from you we find to be an excellent Gas Coal. The yield of both Gas and Coke is good. The illuminating power of the Gas is high and the quality of the Coke is very good.

OBERT ROBSON, Foreman Gas-Works.

From the Cleveland, O., Gas-Light & Coke Co.

Gentlemen—This Company has used between 3,000 and 4,000 tons of your "Sterling Coal," and are still using it with satisfactory results. We find the average product of a ton of 2,000 lbs. is about 8,800 feet of Gas, and about 37 bushels of Coke. The Gas is of good illuminating power and quite free from sulphur or other impurities, one bushel of lime purifying 9,000 feet, and the Coke of very superior quality.

The yield of Gas is about the same as from the Pittsburgh Coal, and the Coke is better adapted to our use.

Yours Truly,

T. DWIGHT EELLS, Secretary.

From the Albany, N. Y., Gas-Light Company.

MESSRS. F. BUTTS & CO.—*Gentlemen*—We have been using your "Sterling Coal" at these works for two years, finding it all that is important in Gas-making Coal, as respects yield and quality of Gas, and freedom from Sulphur—as much so as any of the Coking Coal now in use. We are disposed to contract for a further supply of the same quality. Very Respectfully,

PAUL A. SABBATON, Sup't.

From the Troy, N. Y., Gas-Light Co.

MESSRS. F. BUTTS & CO.:—*Gentlemen*—The Coal we have used the past year at our works has been mostly "Sterling." It has given us full satisfaction in every respect. S. S. DAUCHY. Sup't.

The following analysis of Sterling Coal was made by Prof. J. LANG CASSELS, Professor in the Cleveland, O., Medical College, who stands at the head of his profession as a Chemist, and any statement made by him can be relied upon with safety.

Sp. gr.	1,288	
Hygremaeric Moisture		1.85
Volatile Combustible Matters		34.15
Coke, (clear and porous,)		64.00
		100.00
Fixed Carbon in the Coke	62.00	
Ashes, (yellowish white,)	2.00	
	64.00	
COMPOSITION OF ASHES.		
Silex,		0.80
Al mini,		0.45
Sulphate of Iron,		0.75
		2.00
Per centage of Sulphur,		0.23

J. L CASSELS, M. D.,
Prof. of Chemistry, Clev. Med. Col.

P. S.—The specimen from which the above analysis was made, was taken by myself from a car load, and may be regarded as a fair average; in fact this Coal is very uniform in its characteristics. It als yielded 4 per cent. more gas than the Pittsburgh Coal. J. L. C.

We would also refer to Gas-Light Companies in the following places:

NEW YORK CITY, (Manhattan and New York Co.'s,) BROOKLYN, ALBANY, TROY, WEST TROY, ROCHESTER, OSWEGO, RONDOUT, KINGSTON, ALBION, BROCKPORT, SENECA FALLS, ELMIRA and LYONS, in the State of New York; CLEVELAND, TOLEDO, SANDUSKY, NORWALK and OBERLIN, in Ohio; DETROIT, ANN ARBOR, GRAND RAPIDS and KALAMAZOO, in Michigan; COBURG, in Canada; CHICAGO, Ill., and two Companies in MILWAUKIE, Wisconsin.

The extensive Mines in Pennsylvania, known as the Sterling Hills, (which are the highest in that part of the State,) are wholly under our control, and the Coal is mined and sold only by us or our agents. As the Coal has improved the further we have got in, and being several hundred yards further in than last season, with about a hundred feet more earth over it, *the quality of Coal we mine this year will be better than ever.* Some Coals are good in one or two particulars, and defective in others; but in combining all the qualities desired in a Gas-Coal, we know of none equal to the STERLING. Getting it to this place by Rail-road, a supply can be had during the Summer months, (as well as at all other times,) which is not the case with Coals dependent upon high water for transportation, as are those shipped from Erie, Pa. Having increased our mining facilities, we are prepared to ship on a more extensive scale than heretofore, and should be pleased to receive your orders.

☞ Having discovered that certain unprincipled Coal Dealers are endeavoring to sell an inferior article of Coal, under the name of STERLING, we deem it our duty, as well for your interest as for ours, to notify you, that you may be on your guard in purchasing what you might think was STERLING. *There is but one Sterling Coal Mine, and that Mine we have the full and entire control of;* and Gas-Light Companies can obtain the GENUINE STERLING COAL only by ordering direct from us, or F. WELLINGTON, Syracuse, N. Y., who is our only agent for that State.

F. BUTTS & CO.

CLEVELAND, O., March 1st, 1861.

CLAY RETORTS.

CLAY RETORTS.—J. K. BRICK & Co.—Brooklyn Clay Retort and Fire-Brick Works. Van Dyke, near Van Brunt street, Brooklyn, N. Y.—Manufacturers of Clay Retorts, Fire Brick, Gas and Hot House Tiles, Arch, Furnace and Cupola Brick, Fire Cement, Mortar, &c.

J. K. B. & Co. would invite the attention of Gas Companies to the important fact, that the Clay Retorts manufactured at their Works can be set without Tiles, requiring to be supported only at the front and rear ends, thereby exposing the entire surface of the Retort to the direct action of the flame from the furnace.

The results of this mode of setting, are a Saving of Fuel, Tiles, Transportation of Materials, Labor and Space, thereby enabling Gas Companies to set Retorts of at least 50 per cent. greater capacity than those usually employed in the ordinary arches.

ENGLISH FIRE BRICKS, Rufford's Stourbridge Bricks, Stourbridge and Welsh Clay.
S. THOMPSON'S Neph., IMP'R,
45 Gold-st.

ELLIMAN BROTHERS, 217 Pearl-St., New York, Commission Merchants, Importers of
BELGIAN FIRE-CLAY GAS RETORTS,
Dealers in Tiles, Arch-Bricks, Furnace-Doors, Mouth-Pieces, Covers,
and all other Fittings, of the most approved patterns, for setting Clay Retorts.
SABBATON'S PATENT FURNACE-DOORS, & FRAMES,
Floyd's Patent Malleable Iron Retort Covers,
McKENZIE'S PATENT GAS-EXHAUSTERS,
made by Addison Smith. Compensator-Valves, &c. Gas, Water, and Steam Tubes

GAUTIER'S CLAY RETORTS.— Fire and Arch Bricks, Gas-House Tiles, &c. Black Lead Crucibles for Steel Works and Brass Founders.
MANY, BALDWIN & MANY, 49 John-st., N. Y.

PHILADELPHIA FIRE-BRICK Works, corner of Vine and Twenty-third streets, Philadelphia.
JOHN NEWKUMET,
Manufacturer of all kinds of FIRE-BRICK, GAS-HOUSE TILES, to suit all the different plans in use. Clay Retorts and Dentists' Muffles. Orders filled at short notice

PATENT PYRO-CLAY GAS RETORTS. THOMAS HOADLEY, Patentee, wishes to call the attention of Gas-Engineers to these
RETORTS,
as a very superior article.
REFERENCES:—Gas-Light Works, Buffalo, N. Y.
" " Cleveland, O.
" " Chicago, Ill.
THOS. HOADLEY
Corner of Main and Mulberry Sts., Cleveland, O.

ADDISON POTTER,
WILLINGTON QUAY,
NEAR NEWCASTLE UPON-TYNE, ENGLAND,
Manufacturer of CLAY RETORTS, FIRE BRICKS, and every description of FIRE CLAY GOODS.

COWEN'S PATENT FIRE-CLAY Retorts.
JOSEPH COWEN & Co., Blaydon Burn, near Newcastle-on-Tyne, England, were the only parties to whom a Prize Medal was awarded at the Great Exhibition in London, of 1851, for "GAS RETORTS AND OTHER OBJECTS IN FIRE CLAY."
J. C. & Co. have been for many years the most extensive manufacturers of Fire Clay Retorts in the United Kingdom; and orders for FIRE CLAY RETORTS of all shapes and dimensions, FIRE BRICKS, and every other article in Fire Clay, are promptly executed at their works as above.
COWEN'S GARESFIELD COAL AND COKE.
Coal and Coke office,
QUAY SIDE, NEWCASTLE ON TYNE.

WILLIAM RYDER. General Mineral and Metal Agent and Merchant, 4 Dean street, NEWCASTLE-ON-TYNE, England, is prepared to supply Gas Companies and others with every variety of appliance for the production and supply of Gas, including GASOMETERS, RETORTS (metal and clay), FIRE BRICKS, COALS, METAL MAINS, TUBES, in wrought iron, copper, brass, lead or composition, METERS, TAPS, FITTINGS, &c., &c.; and from his extensive experience in this class of work, can guarantee every thing of the best description.

CLIFF'S ENGLISH CLAY RETORTS
Retort-Covers, Gas-Exhausters, Furnace Doors, Castings, Implements, Photometrical and Meter-Proving Apparatus.
T. W. PARMELE, Sole Agent,
No. 4 Irving Place, New-York.

STOP-COCKS, &C.

DANIEL THOMPSON, Machinist and manufacturer of Stop Cocks, Fire Plugs, &c., for Water-Works, STOP COCKS, VALVES, DRIP PUMPS, &c., for Gas-Works, No. 133, Elfreth Alley, Philadelphia.

IRON FOUNDRIES.

S. V. MERRICK, J. VAUGHAN MERRICK,
W. H. MERRICK.

SOUTHWARK FOUNDRY, Philadelphia.
MERRICK & SONS, Engineers, manufacturers of every description of Gas Machinery.
Retorts, Bench Castings, Condensers, Washers, Scrubbers, Wet or Dry Lime Purifiers, Coke Wagons, Fire Tools, Wrought Iron Grate Bars, Gasholders, either TELESCOPIC OR SINGLE, WITH SUSPENSION FRAMES COMPLETE; Wrought Iron Roof Frames, for Iron or Slate; Stop Cocks, Exhausters, Steam Pumps, Boilers and Tanks, Steam or Hand Air Pumps for proving Street Mains, Centre Seals, Governors, Wrought or Cast-Iron Lime Sieves for Purifiers, Purifier Hoisting Machines, &c., &c.
Address— MERRICK & SONS,
5th and Washington Streets, Philadelphia.

BERGEN IRON WORKS. Established 1833.
R. A. BRICK, Manufacturer of CAST-IRON WATER and GAS PIPES. RETORTS, PIPES, &c., always on hand. Office 109, Leonard street, New York.

OREGON FOUNDRY, Nos. 740, 742, 744 Greenwich street, New York.
HERRING & FLOYD, proprietors, manufacture Gas Compensators of all sizes, Self-Acting Valves, Exhausters upon an improved plan, costing less than half those of English manufacture, also castings of every description for Gas and Water-Works.
Herring & Floyd offer for sale Sabbaton's Patent Screening Shovels for coke and coals, made of malleable iron, of all sizes; Sabbaton's Patent Improved Cast Iron Furnace Frame and Door, arranged to protect the iron work of the door and frame from direct contact with the fire; also Floyd's Patent Malleable Iron Retort Covers, only quarter of an inch thick, but of convex form, and of great strength, as is attested by certificates from several of the leading Gas-works in America. For engravings of all the above patents see AMERICAN GAS LIGHT JOURNAL for October, 1859, pages 65 and 71.
Samples of the above castings can be seen at the Rooms of the AMERICAN GAS-LIGHT JOURNAL.

COLWELL & CO., Manufacturers of Pig Iron and Cast Iron Gas and Water Pipes, No. 207 North Water street and 206 North Wharves, Philadelphia.
STEPHEN COLWELL, W. DWIGHT BELL,
THEO. TREWENDT, SAMUEL FULTON.

TRANER & MERCER, 117 North Water street, and 124 North wharves, Philadelphia, AGENTS FOR THE MERCER FOUNDRY, AND ELK STREET IRON WORKS
CAST IRON STREET MAINS; *Bends, Branches, Chemical Retorts, and all kinds of Castings for* GAS-WORKS, either COAL or ROSIN WORKS. SHEET IRON FOR GASOMETERS *cut and punched to order.* BOILER IRON *of all descriptions.* RUSSIA SHEET IRON, TIN PLATES, BLOCK TIN, COPPER, PIG LEAD, SPELTER, and Metals generally.

Florence Iron Works.—The subscriber is prepared to execute orders and make contracts for Cast-Iron Water and Gas-Pipes, from 2 inches to 48 inches in diameter; also, Retorts, Bench Castings, Branches, Bends, and all Castings for Water or Gas-Works. Pipes and Castings coated with Smith's Patent Coal Tar Varnish to prevent corrosion.
JOSEPH G. JONES,
205½ Walnut Street, Philadelphia.

GAS-COAL.

CLEVELAND, O., Nov. 28, 1860.

THE PARTNERSHIP heretofore existing under the name of Butts & Kendall, has expired by its own limitation with the close of the business of the present season.
F. BUTTS & CO.,
will hereafter have the control of the mines of the STERLING COAL AND MINING COMPANY,
and with such increased facilities, both as to improvements perfected at the mines and transportation of coal, as will enable them to continue the business on a more extensive scale than heretofore in *supplying Gas-Light Companies* in the different States, both East and West.
We are now prepared to contract for the delivery of the
CELEBRATED STERLING COAL
for the coming season; also, Pittsburg and other varieties of GAS-COALS.
You will therefore please to address, in relation to such contracts, F. BUTTS & CO.,
Post-Office Drawer, 74. Cleveland, Ohio.

LIVERPOOL AND NEWCASTLE CANNEL & COAL,
FOR
Gas-Manufacturers and House Use.
The careful shipment of the best qualities, of Cannel and Coal, at the lowest rates current at the time of engagement guaranteed.
T. W PARMELE, Agt.,
No. 4 Irving Place, New-York.

CANNEL AND ORREL GAS-Coal.—The Subscribers are constantly receiving direct, from the celebrated mines of WILLIAM H. BRANKER & Co., NEWCASTLE, ENG., COAL of the very first quality for gas purposes, which they will sell direct from ship or from yard at the lowest market price; and we guarantee the coal to be equal if not superior to any other coal brought to this market.
CORNELIUS BAKER & SON,
61 Leonard st. and 652 Hudson st. New York.

IRON FOUNDRIES.

MORRIS, TASKER & CO., PASCAL IRON WORKS,
[ESTABLISHED 1821]
PHILADELPHIA, manufacture Wrought Iron Welded Tubes for Gas, Steam or Water; Lap Welded Boiler Flues,
GALVANIZED WROUGHT IRON TUBES,
ARTESIAN WELL PIPES,
of Wrought or Cast Iron, screwed together, flush inside and out; Gas-works Castings, Retorts and Bench Castings for Coal gas works; Cast Iron Street Mains, Sends, Branches, Drips, &c.
GAS AND STEAM FITTERS' TOOLS, &c.
STEPHEN MORRIS, CHAS. WHEELER,
THOMAS S. TASKER, STEPHEN P. M. TASKER.

CAST IRON WATER, GAS, DRAIN, AND HEATER PIPES, &c.,
COLUMBIAN IRON WORKS,
OFFICE, No. 46 NORTH SEVENTH STREET,
Below Arch street, Philadelphia.
THOS. M. ADAMS, Proprietor.

TO GAS AND WATER COMPAnies:
The undersigned, Agent for Messrs. Thomas Edington & Sons, Phenix Foundry, Glasgow, Scotland, Is prepared to contract for all descriptions of Cast-iron Pipes of their manufacture.
About 6000 tons of these Pipes have lately been supplied to the Brooklyn Water-works, N. Y., and the Chief Engineer of the Works, A. P. Kirkwood, Esq., is ready to testify to their excellent quality.
ARCH'LD BAXTER, 28 Beaver st., N. Y.
Sole Agent For the United States and Canada.

R. D. WOOD & CO.,
MANUFACTURERS OF
CAST-IRON PIPE, RETORTS, &c.
Office, 400 Chestnut Street,
PHILADELPHIA.

CAST-IRON PIPES.—EARL'S IRON WORKS, NEWARK, N. J., 91, 93, 95, 97 and 99 Chestnut street. Branch Office, 21 Centre street, New York.
The subscriber continues to manufacture Superior Cast-Iron Gas and Water Pipes, Branches, Bends, Angles, Bevel Hubs, Reducers, Sleeves, Drip Syphons, Plugs, Caps, Retorts, Bench Castings, and Castings in general. Particular attention paid to all Castings connected with Gas Works.
E. B. EARL.

S. S. ASHCRAFT, Cincinnati, O., Manufacturer of Gas and Water-Pipes, with Branches of every description; Retorts for Gas and Oil Works; Gasholder Stands, Columns, &c.; Gas Purifiers, Condensers, and Gas Apparatus of all kinds; Foundry Work in general.
N. B.—A complete selection of Patterns on hand. Refer to any of the Gas Works in the Western and Southwestern States.
THEODORE SCOWDEN, Engineer, Louisville.
JOHN JEFFREY, Civil Engineer, Cincinnati.
JACOB HOUGHTON, Engineer, Detroit.

Warren Foundry & Machine CO., Phillipsburgh, N. J.
Manufacturers of Cast Iron Pipes, from 2 to 48 inch diameter, all pipes from 3 inch to 48 inch cast vertically, and in dry sand, in lengths of 12 feet. 2 inch pipes in lengths of 7 feet. Special Castings of all descriptions furnished at short notice.
REFERENCES.
Croton Aqueduct dept., N. Y.
Manhattan Gas Lt. Co., N. Y.
Brooklyn Water dept., N. Y.
Brooklyn Gas Lt. Co., N. Y.
Citizens' Gas Lt. Co., Brooklyn, N. Y.
Samples of our pipe may be seen at the Rooms of the AMERICAN GAS-LIGHT JOURNAL, N. Y.

DRAIN-PIPE.

DRAIN PIPES, ENGLISH and AMERICAN.
Garnkirk Chimney Tops,
Plumbers' Materials.
Minton's Encaustic Tiles.
For Sale by
MILLER & COATES,
279 Pearl-st., New York.

STEAM-PUMPS.

WORTHINGTON'S STEAM PUMPS, extensively used by Gas-Light Companies, For Sale at greatly Reduced Prices.
Also, a new and highly successful Pump, driven by water pressure, requiring no attention or repairs, and the most economical water motor yet constructed.
Patent GATES, for Water and Steam-stops.
HENRY R. WORTHINGTON,
61 Beekman street, N. Y.

BURNELL'S PATENT ROTARY PUMP, adapted to all purposes of Pumping, from the well and cisterns to the steam fire-engine. The most simple, durable and efficient Pump yet made.
Principal sales depot at No. 23 Platt street, New York. SAMUEL B. LEACH.

CARDS.

NATIONAL DIRECTORY OF Gas & Steam Fitters & Plumbers

ALBANY, N. Y.
WILLIAM MUNSIG, 633 Broadway.
ALEX. B. SHEPARD, 17 South Pearl St.

BALTIMORE, MD.
BLAIR & CO., 366 W. Baltm're St.
GRATTAN & EVANS, 8 North St.
J. H. McCALL & CO., 15 W. Fayette St.
JOHN RICHARDS, 374 W. Baltm're St.

BOSTON, MASS.
J. KENNEDY, 45 Maverick Sq.
W. WILTSHIRE, 46 Devonshire St.
N. P. WOODMAN, 13 Haverhill St.
J. B. WRIGHT, 28 Devonshire St.

CINCINNATI, O.
BAKER & VON PUHL, 64 Fourth St.

NEW YORK.
JAMES HELME 58 East 13th St.
WM. TOWERS, 31 Carmine St.
GEO. C. ELLISON, 859 Broadway.
B. M. JOHNSON, 111 East 18th St
LOCKE & CRAIGIE, 12 East 20th St.
McKENZIE & O'HARA, 386 Fourth St.
ANTHONY KENDALL 358 W. 36th St.
DAVIS B. LANE, 167 William St.
F. B. LANGWITH, 62 White St
FRANCIS MATTHEWS, 47 Ann Street.
CHAS. F. MERRITT, 156 Seventh Ave
WM. PALMER, 408 Eighth Ave.
GEORGE E. PARKER, 156 Seventh Ave.
DAVID REA, 48 Cortlandt St.

GAS-ENGINEERS.

C. N. TRUMP, Gas-Works Engineer, No. 56, North Seventh-street, Phila. Agent for the Aubin Gas-Works.
Gas-Works erected for Towns, Villages, Factories, and Dwellings.

JAMES RENWICK SMEDBERG, Consulting and Constructing GAS-ENGINEER. SAVANNAH, Geo.
REFERENCES:
CHARLES ROOME, Esq., Pres. Man. Gas Co., N. Y.
J. K. BRICK, Esq., Eng'r. Brooklyn Gas Co., "
Messrs. ELLIMAN BROTHERS, New-York.
F. T. WILLIS, Esq., Pres. Savannah Gas Co.
J. A. SABBATON, Esq., Eng'r. Man. Gas Co., N. Y.
JOHN R. MURRAY, Prop. AM. GAS-LIGHT. JOUR.

SCAMMON'S GAS-APPARATUS for private residences, factories, hotels and cities. See engravings of Rosin and Coal Gas-Works in AMERICAN GAS-LIGHT JOURNAL for Dec. 1, 1860, pages 179 and 180.
STEPHEN SCAMMON,
GAS-ENGINEER AND CONTRACTOR,
561 Broadway, New York.

GAS-WORKS ERECTED FOR Cities and Villages. Plans and Specifications furnished for works of any desired capacity, drawings of Retort Settings for Benches of one, two, three, or five Retorts.
GAS APPARATUS
of every description.
F. A. SABBATON.
Gas-Engineer and Contractor, Albany, N. Y.

WATERHOUSE & BOWES, Raleigh, N. C. Builders of Gas-Works in Southern States. The following Gas-works have been built by them, and are their references.
Charlotte, N. C. Jacksonville, Fla.
Raleigh, N. C. Fayetteville, N. C.
Salisbury, N. C. Staunton, Va.
Yorkville, S. C. Greenville, S. C.
Waverly, Miss

DIMMOCK, DWIGHT & CO., Engineers and Contractors for the erection of Coal Gas-Works. Offices 135 and 137 William street, New York city; and No. 2 Elm street Springfield, Mass.
REFERENCES BY PERMISSION:
GEORGE D. MORGAN, Esq., New York.
AARON CLAFLIN, Esq., "
A. B WOOD, Esq., "
GEORGE RIES, Esq., N. Y., Pres. M. S. & N. I. R.R.Co.
GEO. M. ATWATER, Esq., Springfield, Mass.
JAS. D. BREWER, Esq., Pres. Springfield Gas Co.,
JOHN I. BAKER, Esq., Pres Beverly Gas Co.;
HENRY E. RUSSELL, Esq., Pres. N. Britain Gas Co.
J. DUNHAM, Esq., Pres. Norwich, Ct. Gas Co.,
W. C. STREET, Esq., Sec. Norwalk Ct. Gas Co.

WATER-METERS.

H. R. WORTHINGTON'S Patent Water-Meter.—This Meter combines accuracy, simplicity and remarkable durability, with such ease and certainty of motion, as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities, with its low cost, have caused its extensive adoption by corporations and individuals, in many of our largest cities.
HENRY R. WORTHINGTON,
61 Beekman street, N. Y.